

Arizona State Retirement System Investment Committee

Fixed Income Asset Class Review

June 24, 2013



EXECUTIVE SUMMARY

Arizona State Retirement System

U.S. Fixed Income Asset Class Overview

- **Market Value as of May 31, 2013:**

- \$6.8 B with GTAA
- \$5.8 B without GTAA

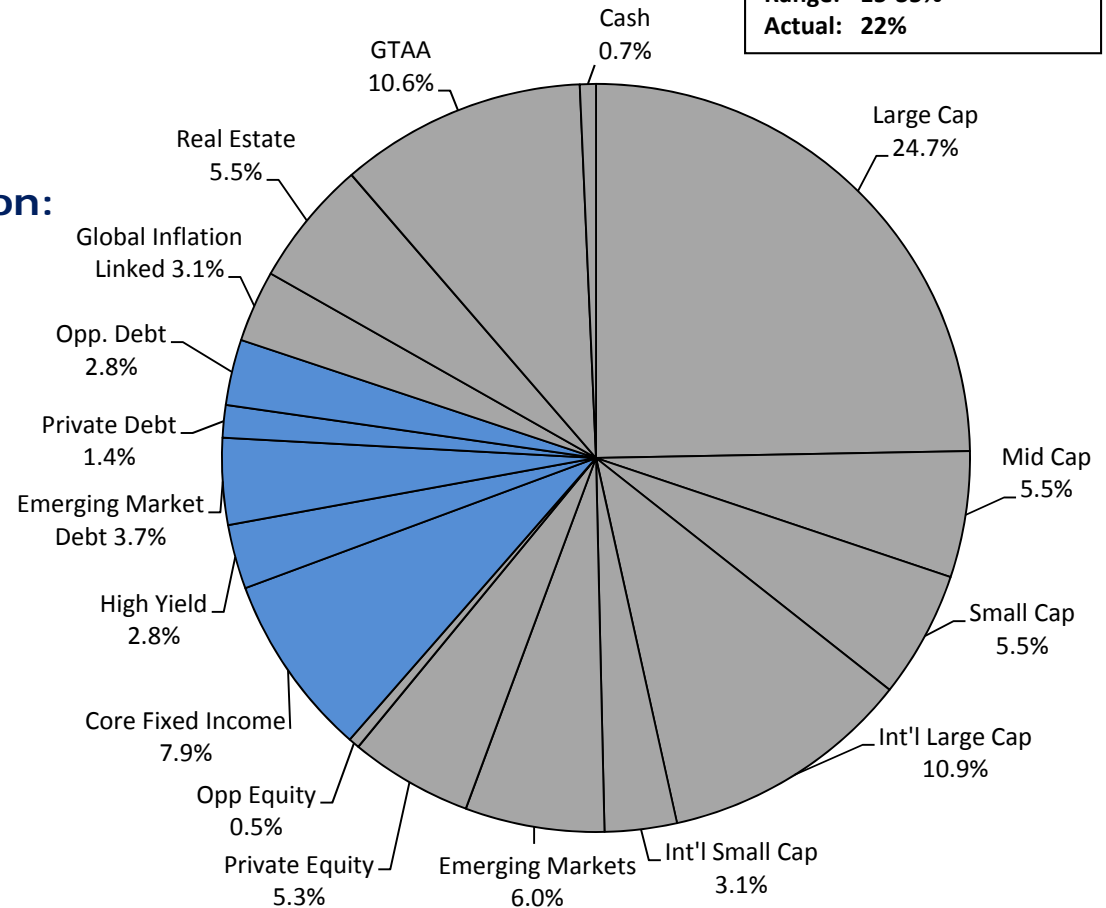
- **Passive Allocation: 36%**

- **Fixed Income Style Composition:**

- Core: 43%
- HY: 15%
- EM Debt: 20%
- Private Debt: 7%
- Opp Debt: 15%

- **Portfolios:**

- 2 Passive
 - Core: 2
- 18 Active
 - Core: 1
 - HY: 2
 - EM Debt: 3
 - Opp Debt: 7
 - Private Debt: 5



Note: Domestic Equity, International Equity, Fixed Income, Real Estate and Commodities allocations exclude GTAA portfolios.

Executive Summary

- Over the past decade, the ASRS Fixed Income Portfolio has benefited from a falling interest rate environment and periods of spread compression which have resulted in annualized returns ranging from 5.0-6.5% over the past three-, five- and ten-year periods. The portfolio has produced excess returns relative to its benchmark in each of these periods. Recently, rising interest rates and widening credit spreads have resulted in a low single-digit return for latest one-year period.

Arizona State Retirement System

Fixed Income Performance Summary as of May 31, 2013 - Preliminary

	Market Value (\$)	% of Portfolio	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Fixed Income	4,513,123,344	17.7	-0.8	-0.5	2.7	5.7	6.4	5.1	8.7	Jul-75
ASRS Custom Fixed Income Benchmark			<u>-0.5</u>	<u>-0.2</u>	<u>2.3</u>	<u>5.2</u>	<u>5.9</u>	<u>4.9</u>	--	Jul-75
Over/Under			-0.3	-0.3	0.4	0.5	0.5	0.2		

Note: Performance is based on net of fee performance data.

ASRS Custom Fixed Income Index calculated as follows: Barclays Capital U.S. Aggregate Index through 12/31/2010; 93% Barclays Capital U.S. Aggregate Index, 7% Barclays Capital U.S. High Yield Bond Index through 6/30/2012; 59% Barclays Capital U.S. Aggregate Index, 23% Barclays Capital U.S. High Yield Bond Index, 18% JP Morgan GBI-EM Global Diversified thereafter.

Arizona State Retirement System

Fixed Income Performance Summary as of March 31, 2013 - FINAL

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	9 Mo (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Return (%)	Since
Total Fixed Income	4,556,993,898	15.1	0.5	31	3.4	42	5.5	47	6.5	45	6.5	41	5.5	41	8.8	Jul-75
<i>ASRS Custom Fixed Income Benchmark</i>			<u>0.6</u>	27	<u>2.8</u>	50	<u>4.9</u>	52	<u>6.2</u>	49	<u>5.8</u>	50	<u>5.2</u>	47	--	Jul-75
Over/Under			-0.1		0.6		0.6		0.4		0.7		0.3			
<i>eA All US Fixed Inc Net Median</i>			0.2		2.8		5.0		6.1		5.8		5.1		--	Jul-75

Note: Performance is based on net of fee performance data.

ASRS Custom Fixed Income Index calculated as follows: Barclays Capital U.S. Aggregate Index through 12/31/2010; 93% Barclays Capital U.S. Aggregate Index, 7% Barclays Capital U.S. High Yield Bond Index through 6/30/2012; 59% Barclays Capital U.S. Aggregate Index, 23% Barclays Capital U.S. High Yield Bond Index, 18% JP Morgan GBI-EM Global Diversified thereafter.

Executive Summary (continued)

- **With interest rates near record low levels, ASRS has shifted assets away from low-yielding, treasury-sensitive core markets to higher-yielding, less treasury-sensitive asset classes including emerging market debt, private debt, and high yield bonds. The adoption of the June 2012 SAAP resulted in the following changes to ASRS's fixed income allocation:**
 - The policy weight for total fixed income was reduced to 25% of the total fund from 26%.
 - The policy weight for core fixed income was lowered to 13% from 24%.
 - Emerging Market was added as a new asset class with a 4% policy weight.
 - Private Debt was added as a new asset class with a 3% policy weight.
 - The policy weight for High Yield was increased to 5% from 2%.

Executive Summary (continued)

- **IMD staff has done the following to implement the June 2012 SAAP:**
 - Added 3 new Emerging Market Debt strategies.
 - Added 5 new Private Debt strategies.
 - Reduced our holdings in Core Fixed Income by over \$2 billion since March 2012 through withdrawals from the F2 internally managed portfolio and the PIMCO separate account, as well of the defunding of Blackrock passive modules.
 - Hired 2 new high yield managers to potentially increase our funding to high yield; in June, we funded one of the mandates following a sell-off in the high yield market.

CORE FIXED INCOME

Core Fixed Income

Core fixed income represents the US investment-grade market which includes US Treasuries and Agencies, Agency Mortgage-Backed Securities, Corporate Bonds, Commercial Mortgage-Backed Securities (CMBS) and Asset-Backed Securities (ABS). Its benchmark is the Barclays U.S. Aggregate Bond Index, which encompasses the market for U.S. dollar denominated, fixed-rate, taxable, investment-grade bonds that are SEC-registered.

The performance of core fixed income is heavily tied to the direction of US Treasury rates. In addition, core fixed income tends to perform well when equity markets decline (ex. 2008). As a result, it is an important part of the overall ASRS portfolio because it provides a source of balance and diversification.

IMD House View:

The core fixed income market is relatively unattractive due to relatively low overall yields as Treasury rates remain at artificially low levels, credit spreads are relatively tight and spreads on agency MBS are compressed due to aggressive buying by the Fed. The market is vulnerable to rising interest rates should the US economy demonstrate sustained improvement and the Fed tapers off its asset purchases.

Actual Weighting vs. SAAP Policy:	Underweight
ASRS Actual Weighting (May 31, 2013)	11.3%
Core Fixed Income Policy	13.0%

Core Fixed Income Managers

Portfolio	Market Value (\$MM) 5/31/13	%	IMD Commentary
F2 Internally Managed Account	\$2,089	83	The objective of the F2 portfolio is to slightly outperform the Barclays U.S. Aggregate Bond Index (the "Index") through a stratified sampling strategy. History of modest outperformance in line with expectations.
PIMCO Separate Account	\$404	16	Active strategy which utilizes non-index investments including derivatives. History of significant outperformance and value-added client service.
Blackrock Intermediate Government/Credit Fund	\$24	1	Passive portfolio for System assets.
Total	\$2,517	100	

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Core Fixed Income Performance Summary as of May 31, 2013 - Preliminary

	Market Value (\$)	% of Portfolio	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total Core Fixed Income	2,517,372,687	9.9	-0.6	-0.7	1.1	4.8	5.9	4.9	8.7	Jul-75
Barclays Aggregate			<u>-0.7</u>	<u>-0.9</u>	<u>0.9</u>	<u>4.6</u>	<u>5.5</u>	<u>4.7</u>	--	Jul-75
Over/Under			0.1	0.2	0.2	0.2	0.4	0.2		
Active Core Fixed Income										
PIMCO	404,825,711	1.6	-0.7	-0.4	2.1	5.4	--	--	5.6	Feb-10
Barclays Aggregate			<u>-0.7</u>	<u>-0.9</u>	<u>0.9</u>	<u>4.6</u>	<u>5.5</u>	<u>4.7</u>	<u>4.8</u>	Feb-10
Over/Under			0.0	0.5	1.2	0.8			0.8	
Enhanced Passive Core Fixed Income										
Internally Managed F2	2,089,089,264	8.2	-0.6	-0.7	1.0	4.8	5.8	4.8	6.0	Oct-00
Barclays Aggregate			<u>-0.7</u>	<u>-0.9</u>	<u>0.9</u>	<u>4.6</u>	<u>5.5</u>	<u>4.7</u>	<u>5.8</u>	Oct-00
Over/Under			0.1	0.2	0.1	0.2	0.3	0.1	0.2	
Passive Intermediate Gov't/Credit Fixed Income										
BlackRock Intermediate Gov't/Credit Bond Index	23,457,713	0.1	-0.4	-0.2	1.7	4.1	--	--	6.0	Nov-08
Barclays Int Gov't/Credit			<u>-0.4</u>	<u>-0.3</u>	<u>1.6</u>	<u>4.0</u>	<u>4.8</u>	<u>4.1</u>	<u>5.9</u>	Nov-08
Over/Under			0.0	0.1	0.1	0.1			0.1	

1. BlackRock Intermediate Gov't/Credit Bond Index is System only.

Note: Performance is based on net of fee performance data.



NEPC, LLC

May 31, 2013

Arizona State Retirement System

Core Fixed Income Performance Summary as of March 31, 2013 - FINAL

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	9 Mo (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Return (%)	Since
Total Core Fixed Income	2,535,738,039	8.4	0.1	49	1.8	81	3.9	82	5.6	77	5.9	48	5.2	48	8.7	Jul-75
Barclays Aggregate			<u>-0.1</u>	80	<u>1.7</u>	83	<u>3.8</u>	85	<u>5.5</u>	83	<u>5.5</u>	75	<u>5.0</u>	60	--	Jul-75
Over/Under			0.2		0.2		0.1		0.1		0.5		0.2			
eA US Core Fixed Inc Net Median			0.1		2.6		4.7		6.0		5.9		5.1		--	Jul-75
Active Core Fixed Income																
PIMCO	408,319,017	1.4	0.5	14	3.1	30	5.5	28	6.4	31	--	--	--	--	6.3	Feb-10
Barclays Aggregate			<u>-0.1</u>	80	<u>1.7</u>	83	<u>3.8</u>	85	<u>5.5</u>	83	<u>5.5</u>	75	<u>5.0</u>	60	<u>5.3</u>	Feb-10
Over/Under			0.6		1.4		1.7		0.8						1.0	
eA US Core Fixed Inc Net Median			0.1		2.6		4.7		6.0		5.9		5.1		5.8	Feb-10
Enhanced Passive Core Fixed Income																
Internally Managed F2	2,103,847,348	7.0	0.0	66	1.6	87	3.7	86	5.6	77	5.8	55	5.2	48	6.1	Oct-00
Barclays Aggregate			<u>-0.1</u>	80	<u>1.7</u>	83	<u>3.8</u>	85	<u>5.5</u>	83	<u>5.5</u>	75	<u>5.0</u>	60	<u>6.0</u>	Oct-00
Over/Under			0.1		0.0		-0.1		0.1		0.4		0.2		0.1	
eA US Core Fixed Inc Net Median			0.1		2.6		4.7		6.0		5.9		5.1		6.1	Oct-00
Passive Intermediate Gov't/Credit Fixed Income																
BlackRock Intermediate Gov't/Credit Bond Index ¹	23,571,674	0.1	0.3	52	2.1	64	3.6	61	4.8	63	--	--	--	--	6.3	Nov-08
Barclays Int Gov't/Credit			<u>0.3</u>	53	<u>2.0</u>	66	<u>3.5</u>	70	<u>4.7</u>	67	<u>4.6</u>	80	<u>4.5</u>	60	<u>6.2</u>	Nov-08
Over/Under			0.0		0.1		0.1		0.1						0.1	
eA US Interm Duration Fixed Inc Net Median			0.3		2.4		3.8		5.0		5.1		4.6		7.0	Nov-08

1. BlackRock Intermediate Gov't/Credit Bond Index is System only.

Note: Performance, ranks and medians are based on net of fee performance data.



NEPC, LLC

March 31, 2013

HIGH YIELD FIXED INCOME

High Yield Fixed Income

High yield bonds reflect the below investment-grade corporate bond market in the US. Unlike core fixed income which has a high correlation with Treasury rates, high yield bonds have historically has a negative correlation with Treasury rates and a positive correlation with the equity markets.

Returns are heavily influenced by credit developments at highly leveraged companies whose performance is tied to factors that affect equity markets (economic outlook, earnings, cash flow, valuations, etc.)

IMD House View:

Spreads of high yield bonds have substantially compressed since mid-2012; this spread compression has corresponded with an unusual period of diminished volatility in the financial markets. As a result, we have been tactically underweight the asset class. Recently, spreads and yields of high yield bonds have risen making the market more attractive particularly as the rate of corporate defaults is low. With the market more attractive, we increased our exposure to high yield in June by approximately 1% to reduce our tactical underweight to the asset class. We would consider adding further to our exposure should spreads and yields remain attractive.

Actual Weighting vs. SAAP Policy:

ASRS Actual Weighting (May 31, 2013)

High Yield Fixed Income Policy

Underweight

2.8%

5.0%

High Yield Fixed Income Managers¹

Portfolio	Market Value (\$MM) 5/31/13	%	IMD Commentary
Columbia Separate Account	\$689	81	Active manager with flexible investment style that adjusts portfolio risk based on the investment outlook. While Columbia has modestly underperformed the HY benchmark since inception in 2009, it has outperformed in the latest 3 year period in which it ranks in the top quartile of all high yield managers.
Shenkman Separate Account	\$162	19	Active manager with conservative, higher quality investment strategy. This higher quality strategy is the primary reason for ITD underperformance as the riskiest sectors of high yield (CCC's and below) have significantly outperformed. That being said, Shenkman has added value as the account has substantially outperformed core fixed income.
Total	\$851	100	

¹ In 2012, ASRS hired 2 new high yield managers, JP Morgan and DDJ, to potentially increase our funding to high yield. In June 2013, JP Morgan was funded. DDJ remains unfunded.

Arizona State Retirement System

High Yield Performance Summary as of May 31, 2013 - Preliminary

	Market Value (\$)	% of Portfolio	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Total High Yield Fixed Income	850,990,683	3.3	2.0	3.5	13.8	11.7	--	--	11.4	Oct-09
<i>Barclays High Yield</i>			<u>2.2</u>	<u>4.1</u>	<u>14.8</u>	<u>12.2</u>	<u>10.9</u>	<u>9.5</u>	<u>12.7</u>	<i>Oct-09</i>
Over/Under			-0.2	-0.6	-1.0	-0.5			-1.3	
Active High Yield Fixed Income										
Columbia Management	689,257,118	2.7	2.0	3.6	14.3	12.4	--	--	11.9	Oct-09
<i>Barclays High Yield</i>			<u>2.2</u>	<u>4.1</u>	<u>14.8</u>	<u>12.2</u>	<u>10.9</u>	<u>9.5</u>	<u>12.7</u>	<i>Oct-09</i>
Over/Under			-0.2	-0.5	-0.5	0.2			-0.8	
Shenkman	161,733,565	0.6	2.2	3.2	11.6	10.2	--	--	10.3	Oct-09
<i>Barclays High Yield</i>			<u>2.2</u>	<u>4.1</u>	<u>14.8</u>	<u>12.2</u>	<u>10.9</u>	<u>9.5</u>	<u>12.7</u>	<i>Oct-09</i>
Over/Under			0.0	-0.9	-3.2	-2.0			-2.4	

Note: Performance is based on net of fee performance data.



NEPC, LLC

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High Yield Fixed Income Performance Summary as of March 31, 2013 - FINAL

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	6 Mo (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Return (%)	Since
Total High Yield Fixed Income	842,737,378	2.8	2.5	81	5.8	59	12.2	52	10.8	52	--	--	--	--	11.6	Oct-09
Barclays High Yield			<u>2.9</u>	57	<u>6.3</u>	41	<u>13.1</u>	32	<u>11.2</u>	26	<u>11.6</u>	14	<u>10.1</u>	24	<u>12.9</u>	Oct-09
Over/Under			-0.4		-0.5		-0.9		-0.4						-1.3	
eA US High Yield Fixed Inc Net Median			2.9		5.9		12.2		10.8		10.4		9.4		12.2	Oct-09
Active High Yield Fixed Income																
Columbia Management	682,304,641	2.3	2.6	72	6.2	43	13.0	35	11.4	21	--	--	--	--	12.2	Oct-09
Barclays High Yield			<u>2.9</u>	57	<u>6.3</u>	41	<u>13.1</u>	32	<u>11.2</u>	26	<u>11.6</u>	14	<u>10.1</u>	24	<u>12.9</u>	Oct-09
Over/Under			-0.3		-0.1		-0.1		0.2						-0.7	
eA US High Yield Fixed Inc Net Median			2.9		5.9		12.2		10.8		10.4		9.4		12.2	Oct-09
Shenkman	160,432,736	0.5	1.8	97	4.4	95	9.2	93	9.3	81	--	--	--	--	10.4	Oct-09
Barclays High Yield			<u>2.9</u>	57	<u>6.3</u>	41	<u>13.1</u>	32	<u>11.2</u>	26	<u>11.6</u>	14	<u>10.1</u>	24	<u>12.9</u>	Oct-09
Over/Under			-1.1		-1.9		-3.9		-1.9						-2.5	
eA US High Yield Fixed Inc Net Median			2.9		5.9		12.2		10.8		10.4		9.4		12.2	Oct-09

Note: Performance, ranks and medians are based on net of fee performance data.



NEPC, LLC

March 31, 2013

EMERGING MARKET DEBT

Emerging Market Debt

Emerging market debt represents sovereign or corporate debt of entities based in emerging market countries that is issued in either local or hard currency (US dollar or Euro). IMD has chosen to concentrate our investments primarily in local currency sovereign debt, the benchmark for which is the JP Morgan GBI-EM Global Diversified Index. Emerging market debt was added as an asset class in the June 2012 SAAP.

Returns for local currency EM debt have a relatively low correlation with US Treasury rates and a high correlation with emerging market equities and the S&P 500. Returns are affected by: 1) currency exchange rates for emerging market countries relative to the US dollar (appreciation in EM local currencies is positive for returns) which in turn is influenced by the interest rate, economic and fiscal outlooks of EM countries relative to the US, and 2) the required risk premium for holding emerging market debt vs. US Treasuries which is influenced by the demand for risky assets.

IMD House View:

Emerging market debt denominated in local currencies offers attractive yields as well as a potential currency hedge against a decline in the U.S. dollar stemming from long-term U.S. fiscal problems and the Fed's unusually accommodative monetary policy. That being said, we are concerned about two risks of emerging market local debt: 1) the underlying volatility of emerging market currencies and 2) the possibility that the general trend of US dollar depreciation that has boosted returns of emerging market local debt in the past may have ended as the US economy demonstrates an improvement in relative economic outlook and investors show an increasing willingness to add US dollar denominated assets.

Actual Weighting vs. SAAP Policy:

ASRS Actual Weighting (May 31, 2013)
Emerging Market Debt Policy

Slight Under Weight

3.7%
4.0%

Emerging Market Managers

Portfolio	Market Value (\$MM) 5/31/13	%	IMD Commentary
PIMCO Local Currency Separate Account	\$576	50	Active strategy that separates currency and interest rate risk and opportunities in EM debt through utilization of derivatives (primarily currency forwards). Strategy has underperformed since inception in December 2012.
Ashmore Local Currency Bond Fund	\$297	26	Active strategy that seeks to exploit market inefficiencies in EM debt through superior research and insight. Fund has outperformed since inception in December 2012.
Ashmore Blended Separate Account	\$273	24	Active strategy that enables the manager to tactically allocate to either the local or hard currency markets through the use of commingled funds. Strategy has outperformed since inception in December 2012.
Total	\$1,146	100	

Arizona State Retirement System

Emerging Market Debt Performance Summary as of May 31, 2013 - Preliminary

	Market Value (\$)	% of Portfolio	3 Mo (%)	YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Return (%)	Since
Emerging Market Debt Composite	1,144,759,974	4.5	-3.4	-2.8	--	--	--	--	-2.8	Jan-13
<i>JP Morgan GBI - EM Global Diversified Index</i>			<u>-3.5</u>	<u>-3.2</u>	<u>11.6</u>	<u>7.8</u>	<u>7.3</u>	<u>10.7</u>	<u>-3.2</u>	<i>Jan-13</i>
Over/Under			0.1	0.4					0.4	
Ashmore Emerging Market Blended	272,262,258	1.1	-1.8	-1.1	--	--	--	--	-1.1	Jan-13
<i>ASRS Custom Emerging Markets Blended Benchmark</i>			<u>-2.3</u>	<u>-2.4</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>-2.4</u>	<i>Jan-13</i>
Over/Under			0.5	1.3					1.3	
Ashmore Emerging Market Debt LC	296,888,149	1.2	-2.8	-2.2	--	--	--	--	-2.2	Jan-13
<i>JP Morgan GBI - EM Global Diversified Index</i>			<u>-3.5</u>	<u>-3.2</u>	<u>11.6</u>	<u>7.8</u>	<u>7.3</u>	<u>10.7</u>	<u>-3.2</u>	<i>Jan-13</i>
Over/Under			0.7	1.0					1.0	
PIMCO Emerging Market Debt LC	575,609,567	2.3	-4.4	-3.9	--	--	--	--	-3.9	Jan-13
<i>JP Morgan GBI - EM Global Diversified Index</i>			<u>-3.5</u>	<u>-3.2</u>	<u>11.6</u>	<u>7.8</u>	<u>7.3</u>	<u>10.7</u>	<u>-3.2</u>	<i>Jan-13</i>
Over/Under			-0.9	-0.7					-0.7	

Note: Performance is based on net of fee performance data.

Composition of ASRS Custom Emerging Markets Blended Benchmark can be found in the appendix.

Arizona State Retirement System

Emerging Market Debt Performance Summary as of March 31, 2013 - FINAL

	Market Value (\$)	% of Portfolio	3 Mo (%)	Rank	6 Mo (%)	Rank	1 Yr (%)	Rank	3 Yrs (%)	Rank	5 Yrs (%)	Rank	10 Yrs (%)	Rank	Return (%)	Since
Emerging Market Debt Composite	1,178,518,481	3.9	0.1	--	--	--	--	--	--	--	--	--	--	--	0.1	Jan-13
<i>JP Morgan GBI - EM Global Diversified Index</i>			<u>-0.1</u>	--	<u>4.0</u>	--	<u>7.7</u>	--	<u>7.9</u>	--	<u>8.4</u>	--	<u>11.9</u>	--	<u>-0.1</u>	<i>Jan-13</i>
Over/Under			0.2												0.2	
Ashmore Emerging Market Blended	276,773,679	0.9	0.5	14	--	--	--	--	--	--	--	--	--	--	0.5	Jan-13
<i>ASRS Custom Emerging Markets Blended Index</i>			<u>-0.5</u>	38	--	--	--	--	--	--	--	--	--	--	<u>-0.5</u>	<i>Jan-13</i>
Over/Under			1.0												1.0	
<i>eA Emg Mkt Fixed Inc Unhedged Net Median</i>			-0.7		2.7		10.3		9.2		8.9		10.5		-0.7	<i>Jan-13</i>
Ashmore Emerging Market Debt LC	303,190,389	1.0	-0.1	26	--	--	--	--	--	--	--	--	--	--	-0.1	Jan-13
<i>JP Morgan GBI - EM Global Diversified Index</i>			<u>-0.1</u>	26	<u>4.0</u>	31	<u>7.7</u>	69	<u>7.9</u>	80	<u>8.4</u>	76	<u>11.9</u>	22	<u>-0.1</u>	<i>Jan-13</i>
Over/Under			0.0												0.0	
<i>eA Emg Mkt Fixed Inc Unhedged Net Median</i>			-0.7		2.7		10.3		9.2		8.9		10.5		-0.7	<i>Jan-13</i>
PIMCO Emerging Market Debt LC	598,554,413	2.0	0.0	22	--	--	--	--	--	--	--	--	--	--	0.0	Jan-13
<i>JP Morgan GBI - EM Global Diversified Index</i>			<u>-0.1</u>	26	<u>4.0</u>	31	<u>7.7</u>	69	<u>7.9</u>	80	<u>8.4</u>	76	<u>11.9</u>	22	<u>-0.1</u>	<i>Jan-13</i>
Over/Under			0.1												0.1	
<i>eA Emg Mkt Fixed Inc Unhedged Net Median</i>			-0.7		2.7		10.3		9.2		8.9		10.5		-0.7	<i>Jan-13</i>

Note: Performance, ranks and medians are based on net of fee performance data.

PRIVATE DEBT

Private Debt

Private debt is comprised of illiquid loans and bonds that fund highly leveraged companies and real estate properties that are too small in size to meet the requirements of the tradable leveraged loan, high yield bond, or commercial mortgage-backed securities markets. For example, private debt may consist of secured loans funding leveraged buyouts of small to mid-size companies or mezzanine financing for highly levered real estate properties. Private debt was added as an asset class in the June 2012 SAAP. IMD staff has adopted an implementation plan for private debt which allocates approximately 67% to corporate credit and 33% to real estate credit.

Returns in the asset class are determined by: 1) the expected returns of individual investments (based on the cash coupon rate or spread over LIBOR and other sources of return including underwriting fees, new issuance discounts and premium call features) and 2) the actual level of credit losses experienced.

IMD House View:

Private debt offers the most attractive opportunity in the fixed income markets with double-digit yields readily available for investors willing to accept illiquidity. The market opportunity is principally driven by regulatory constraints that make it unattractive for banks to hold loans or other debt that would have a credit rating that is below investment-grade.

Actual Weighting vs. SAAP Policy: Underweight¹

Actual Weighting (May 31, 2013)	1.4%
Private Debt Policy	3.0%

¹ASRS is tactically overweight based on commitments made of up to 5% of the total fund.

Private Debt Managers

Portfolio	ASRS Commitment (\$MM)	Market Value (\$MM) 5/31/13	%	IMD Commentary
Cerberus ASRS Credit Opportunities Fund	\$400	\$175	41	Partnership with ASRS to invest in secured loans primarily to fund middle market leveraged transactions (ex. buyouts, recapitalizations). The partnership can leverage ASRS's equity investment by up to 1.25x to boost returns. The expected net return of this strategy is 13-15%.
Blackstone/GSO Capital Solutions Fund	\$200	\$168	39	Fund provides rescue financing primarily to companies seeking to avoid a bankruptcy or restructuring. The fund has generated a net return of 13% which is in line with expectations. Investment period ended May 2013; portfolio now running off.
Highbridge Principal Strategies – AP Mezzanine Partners II, LP	\$200	\$41	10	Fund invests primarily in mezzanine debt to fund highly leveraged transactions for larger capitalization companies. The expected net return of this strategy is 11-13%.
White Oak Separate Account	\$160	\$29	7	Separate account invests in secured loans for small- to mid-size companies typically lacking a deal sponsor with an emphasis on lending based on the value of the underlying collateral. The expected net return of this strategy is 12%.
H/2 Core Real Estate Debt Fund	\$250	\$16	3	Fund invests in senior mortgage loans and other conservatively underwritten real estate finance investments. The fund will utilize leverage of up to 60%. The expected net return of this strategy is 6%.
RFM Cactus Holding Company, LLC (Partnership with Related)	\$200	\$0	0	Partnership with ASRS to invest in: 1) "Freddie B" securities, which are first loss tranches of multi-family property securitizations that have been pooled and sponsored by Freddie Mac; and 2) mezzanine debt to finance real estate properties. The expected net return of this strategy is 10%.
Total	\$1,410	\$429	100	

Arizona State Retirement System

Private Debt Performance Summary as of March 31, 2013* - Preliminary

	Market Value	% of Portfolio	Quarter TWR	1 yr TWR	3 yr TWR	Inception		Absolute Return Expectation (net of fees)	Inception Date
						TWR	IRR		
Total Private Debt	\$ 425,240,075	100%	4.44%	N/A	N/A	12.66%	13.98%		
Blackstone / GSO Capital Solutions Fund LP	\$ 179,761,695	42%	4.87%	N/A	N/A	13.12%	13.15%	13%	Jan-10
Cerberus ASRS Credit Opportunities Fund, L.P.	\$ 160,932,248	38%	N/A	N/A	N/A	N/A	3.83%	13%	Jan-13
Highbridge Principal Strategies – Mezz Partners II, L.P.	\$ 43,529,240	10%	N/A	N/A	N/A	N/A	2.14%	11%	Mar-13
White Oak Global Advisors Private Debt	\$ 24,860,632	6%	N/A	N/A	N/A	N/A	6.01%	12%	Feb-13
H/2 Core Real Estate Debt Fund L.P.	\$ 16,156,261	4%	N/A	N/A	N/A	N/A	2.27%	6%	Mar-13

NOTES:

* Performance for Private Debt is lagged by one quarter.

1. Cerberus ASRS Credit Opportunity Fund, Highbridge Principal Strategies, White Oak Separate Account and H/2 Core Real Estate Debt Fund were funded during 1Q13, therefore no performance is available for this reporting period.
2. Time Weighted Returns (TWR) are calculated as the geometric mean of the holding period returns of each underlying investment since the first full quarter after the investment's inception to the report date. Each holding period return is calculated on a quarterly basis by dividing the fund's gain (gross or net depending on the type of report) and income over the time-weighted net capital in every period. Time weighted net capital is equal to the sum of each period's beginning balance and the subsequent cash flows, which are weighted based on the number of days that each cash flow has been outstanding during the corresponding quarter.
3. The TWR is a periodic return, which means that the result corresponds to the return achieved by each underlying investment during the measured period (first full quarter after inception to report date). For comparability purposes and in order to provide a more meaningful result, the TWR is annualized for the cases where funds operational period is more than a year.
4. Returns have been compressed to begin with first full quarter and eliminate partial periods. IRR calculations use actual cash flow dates.
5. The Net IRR is calculated using all outflows to and inflows from the fund investments, including cash flows for expenses and fees paid by the portfolio of those investments.
6. Effective 07/01/12 Blackstone/GSO Capital Solutions Fund LP was transferred from ASRS Opportunistic Portfolio to ASRS Private Debt Portfolio. Cash flows are from 07/01/12.

Arizona State Retirement System

Private Debt Performance Summary as of December 31, 2012* - FINAL

	Market Value (\$)	% of Portfolio	Quarter TWR	YTD TWR	1 yr TWR	3 yr TWR	Inception		Absolute Return Expectation (net of fees)	Inception Date
							TWR	IRR		
Total Private Debt	\$173,084,408	100%	3.1%	7.9%	N/A	N/A	7.9%			
Blackstone / GSO Capital Solutions	\$173,084,408	100%	3.1%	7.9%	N/A	N/A	7.9%	16.2%	13%	Jan-10

NOTES:

* Performance for Private Debt is lagged by one quarter.

1. Time Weighted Returns (TWR) are calculated as the geometric mean of the holding period returns of each underlying investment since the first full quarter after the investment's inception to the report date. Each holding period return is calculated on a quarterly basis by dividing the fund's gain (gross or net depending on the type of report) and income over the time-weighted net capital in every period. Time weighted net capital is equal to the sum of each period's beginning balance and the subsequent cash flows, which are weighted based on the number of days that each cash flow has been outstanding during the corresponding quarter.
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5. Effective 07/01/12 Blackstone/GSO Capital Solutions Fund LP was transferred from ASRS Opportunistic Portfolio to ASRS Private Debt Portfolio. Cash flows are from 07/01/12.

OPPORTUNISTIC DEBT

Opportunistic Debt

Opportunistic debt is tactical in nature and represents asset classes or strategies not encompassed in the SAAP. Since its inclusion in ASRS's portfolio beginning in 2008, opportunistic debt, including both existing and defunded mandates, has generated an aggregate net IRR of 12.8% through 12/31/12.

IMD House View:

Opportunities exist in select fixed income markets (such as distressed debt and asset-backed securities) to achieve outsized returns or generate expected returns that exceed other fixed income asset classes in the SAAP.

Actual Weighting vs. SAAP Policy Target:		Overweight
ASRS Actual Weighting (May 31, 2013)		2.8%
Opportunistic Debt Policy		0.0% (with a range of 0-10%)

Opportunistic Debt Managers

Portfolio	ASRS Commitment (\$MM)	Market Value (\$MM) 5/31/13	%	IMD Commentary
Guggenheim Separate Account	\$150	\$307	35	Separate account invests in securitized debt backed by a variety of assets including collateralized loan obligation (CLO) debt, equipment trust certificates, non-agency RMBS, and CMBS and other miscellaneous assets.
Avenue Europe Capital Partners II	\$250	\$163	19	Fund invests in distressed debt such as bank loans of European companies. Initial funding in 2011; investment period ends in 2014.
TCW Capital Trust	\$150	\$147	17	Fund invests in four asset classes: leveraged loans, high yield bonds, private debt and mezzanine debt. Investment period ends in September 2013.
Oaktree Opportunities Fund VIIIb	\$150	\$141	16	Funds invests in distressed debt primarily corporate such as leveraged loans. Investment period ends in 2014.
Blackrock Mortgage Investors	\$75	\$61	7	Fund invests primarily in non-agency RMBS and CMBS and utilizes leverage to boost returns. Investment period ended in 2012; fund actively returning capital.
Oaktree Opportunities Fund VIII	\$50	\$44	5	Funds invests in distressed debt primarily corporate such as leveraged loans. Investment period ended in 2012; fund actively returning capital.
Blackrock Credit Investors II	\$100	\$7	1	Fund invests in leveraged loans and utilizes leverage to boost returns. Investment period ended in 2010; remaining capital expected to be returned in 2013.
Total	\$925	\$870	100	

Arizona State Retirement System

Opportunistic Debt Performance Summary as of March 31, 2013* - Preliminary

	Market Value	% of Portfolio	Quarter TWR	1 yr TWR	3 yr TWR	Inception		Absolute Return Expectation (net of fees)	Since
						TWR	IRR ⁽⁶⁾		
Total Opportunistic Debt	\$ 870,346,872	100%	2.5%	12.4%	11.1%	8.9%	12.7%		
Guggenheim Partners Asset Management	\$ 297,159,437	34%	3.1%	14.1%	12.4%	17.6%	18.2%	10%	Jul-08
Avenue Europe Special Situations Fund II (U.S.), L.P.	\$ 159,791,563	18%	-2.3%	3.4%	N/A	3.4%	4.6%	15%	Jan-12
TCW Capital Trust	\$ 154,854,502	18%	2.9%	10.3%	8.8%	9.7%	9.2%	10%	Oct-09
Oaktree Opportunities Fund VIIIb, L.P.	\$ 131,680,278	15%	4.4%	11.7%	N/A	11.9%	11.8%	15%	Jul-11
Blackrock Mortgage Investors, L.P.	\$ 64,476,342	8%	3.2%	21.0%	15.7%	9.2%	8.6%	14%	Jan-08
Oaktree Opportunities Fund VIII, L.P.	\$ 52,709,890	6%	7.2%	17.1%	N/A	12.4%	11.8%	15%	Apr-10
Blackrock Credit Investors II, L.P.	\$ 9,674,861	1%	1.0%	5.5%	25.7%	19.8%	15.7%	12%	Jul-08

NOTES:

* Performance for Opportunistic Debt is lagged by one quarter.

1. Time Weighted Returns (TWR) are calculated as the geometric mean of the holding period returns of each underlying investment since the first full quarter after the investment's inception to the report date. Each holding period return is calculated on a quarterly basis by dividing the fund's gain (gross or net depending on the type of report) and income over the time-weighted net capital in every period. Time weighted net capital is equal to the sum of each period's beginning balance and the subsequent cash flows, which are weighted based on the number of days that each cash flow has been outstanding during the corresponding quarter.
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3. Returns have been compressed to begin with first full quarter and eliminate partial periods. IRR calculations use actual cash flow dates.
4. Blackstone/GSO cash flows were transferred effective July 1, 2012 to ASRS Private Debt Portfolio. Cash flows in ASRS Opportunistic are from inception to 6/30/12.

Arizona State Retirement System

Opportunistic Debt Performance Summary as of December 31, 2012* - FINAL

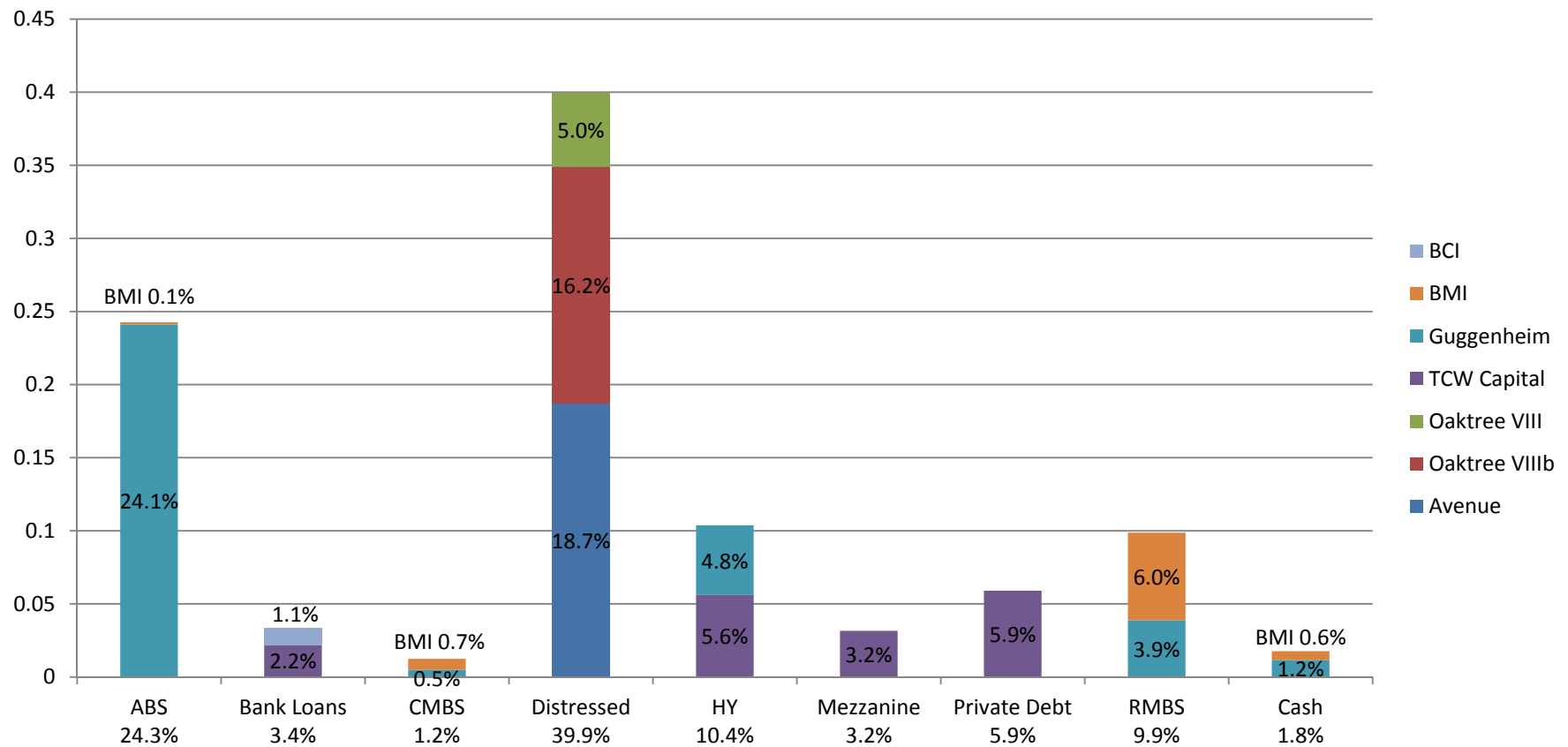
	Market Value (\$)	% of Portfolio	Quarter TWR	YTD TWR	1 yr TWR	3 yr TWR	Inception TWR	IRR	Absolute Return Expectation (net of fees)	Since
Total Opportunistic Debt	\$ 837,080,595	100%	2.5%	14.7%	14.7%	12.4%	8.8%	12.8%		
Guggenheim Partners Asset Management	\$ 288,300,085	35%	3.1%	15.8%	15.8%	13.5%	17.9%	18.5%	10%	Jul-08
Avenue Europe Special Sit. Fund II (U.S.), L.P.	\$ 133,229,219	19%	2.7%	11.4%	N/A	N/A	5.8%	11.3%	15%	Jan-12
TCW Capital Trust	\$ 154,095,541	17%	1.6%	10.9%	10.9%	9.1%	9.5%	9.0%	10%	Oct-09
Oaktree Opportunities Fund VIIIb, L.P.	\$ 118,802,437	15%	1.5%	11.9%	11.9%	N/A	10.6%	9.0%	15%	Jul-11
Blackrock Mortgage Investors, LP	\$ 70,399,358	7%	2.6%	29.2%	29.2%	17.3%	9.0%	8.4%	14%	Jan-08
Oaktree Opportunities Fund VIII, L.P.	\$ 55,173,208	6%	4.1%	16.1%	16.1%	N/A	10.6%	9.8%	15%	Apr-10
Blackrock Credit Investors II, L.P.	\$ 17,080,748	1%	-2.9%	12.8%	12.8%	24.9%	20.8%	15.8%	12%	Jul-08

NOTES:

- * Performance for Opportunistic Debt is lagged by one quarter.
- 1. Time Weighted Returns (TWR) are calculated as the geometric mean of the holding period returns of each underlying investment since the first full quarter after the investment's inception to the report date. Each holding period return is calculated on a quarterly basis by dividing the fund's gain (gross or net depending on the type of report) and income over the time-weighted net capital in every period. Time weighted net capital is equal to the sum of each period's beginning balance and the subsequent cash flows, which are weighted based on the number of days that each cash flow has been outstanding during the corresponding quarter.
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- 3. Returns have been compressed to begin with first full quarter and eliminate partial periods. IRR calculations use actual cash flow dates.
- 4. Blackstone/GSO cash flows were transferred effective July 1, 2012 to ASRS Private Debt Portfolio. Cash flows in ASRS Opportunistic are from inception to 6/30/12.

Opportunistic Debt – Allocation of Investments

Composition per Security Type (as of May 31, 2013)



Note: Distressed includes corporate bonds and non-debt securities (e.g. warrants, preferred stock and common equity) designated by the manager as “distressed” based on a number of factors including ratings (generally below Caa3 or CCC-), trading level (substantial discount to par), expected return, and/or other circumstances (likelihood of bankruptcy or out-of-court restructuring).

APPENDICES

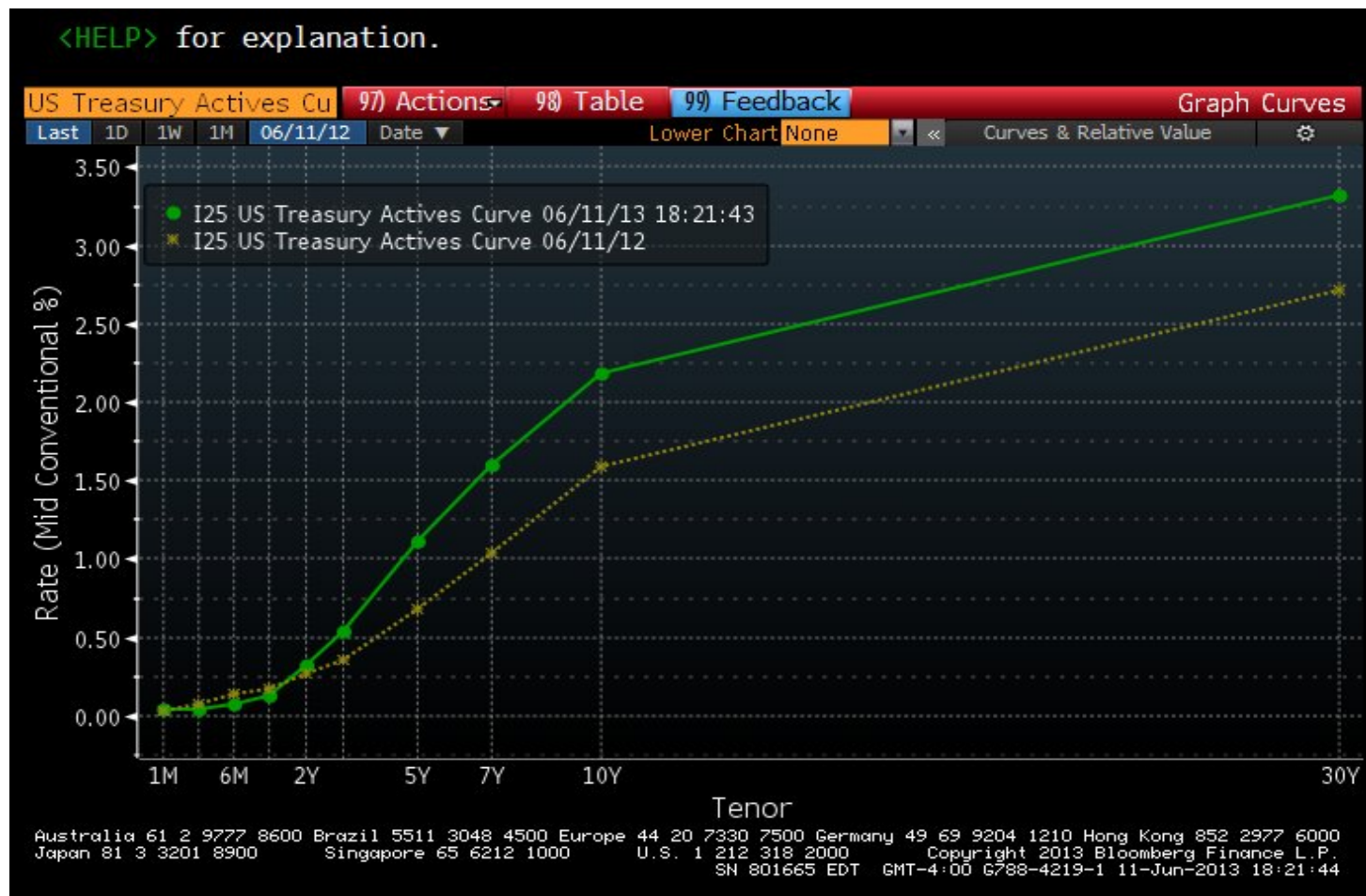
1. Fixed Income Market Environment
2. Correlations Between Various Fixed Income Asset Classes
3. ASRS Strategic Asset Allocation Policy Schematic
4. NEPC Summary of Public Managers' Performance

APPENDIX 1

FIXED INCOME MARKET ENVIRONMENT

Core Fixed Income

Yield Curve



10 Year U.S. Treasury Bond Yield

2003 - 2013



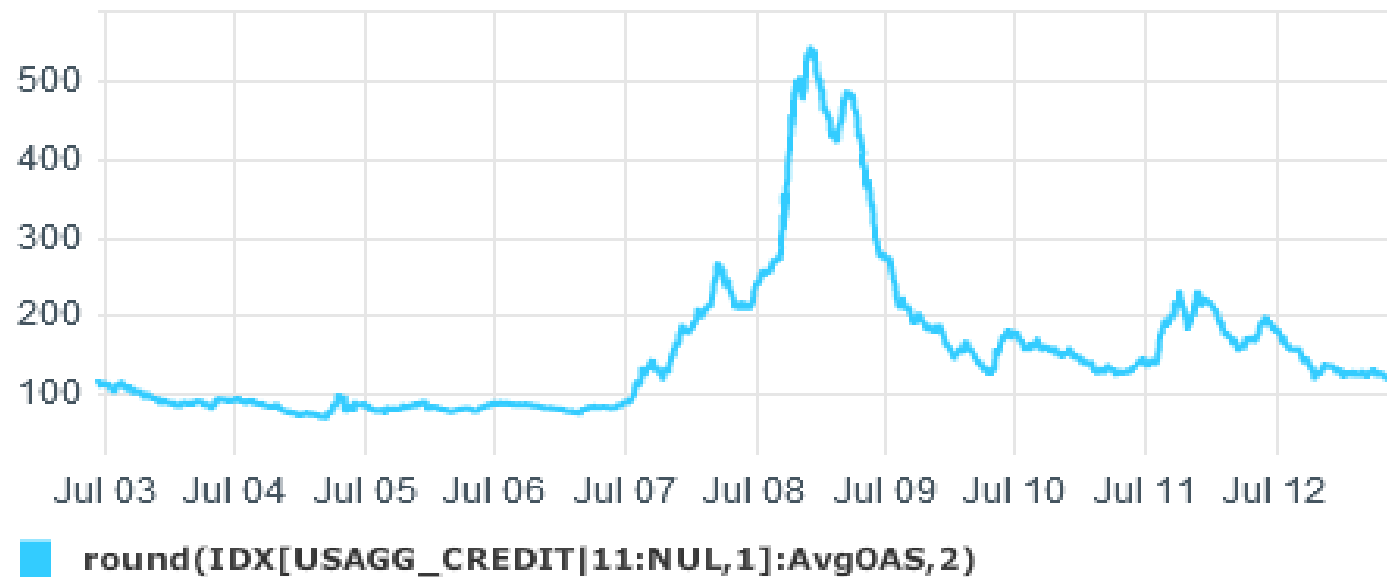
30 Year U.S. Treasury Bond Yield

2003 – 2013



Corporate Investment Grade Spreads

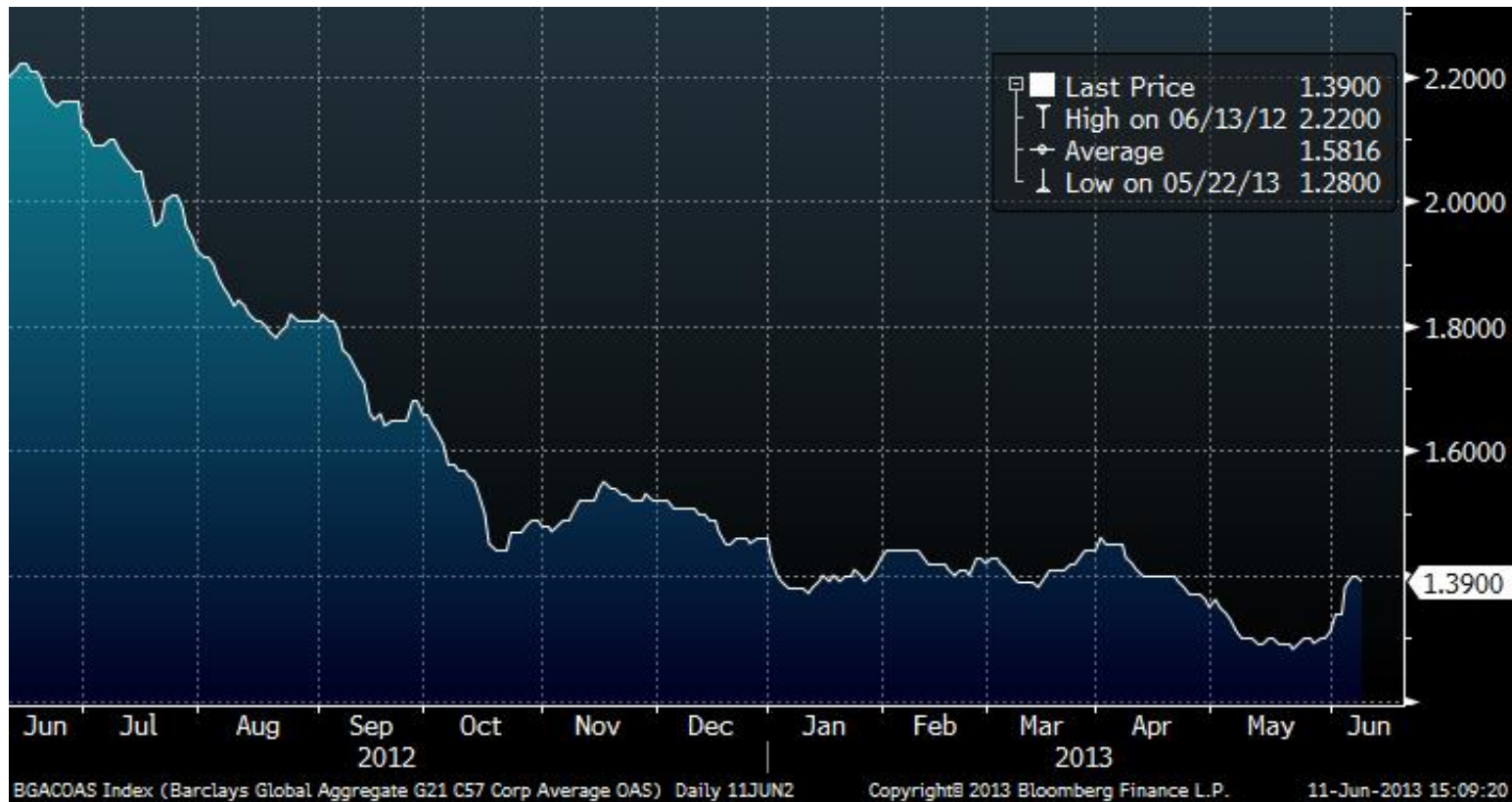
Option Adjusted Spreads (OAS) 2003-2013



Source: Barclays Live - Chart

Corporate Investment Grade Spreads

Option Adjusted Spreads (OAS) June 2012 – June 2013



High Yield Fixed Income

Barclays US Corporate High Yield Index Option Adjusted Spread (OAS) 2003 - 2013



Barclays US Corporate High Yield Index

Option Adjusted Spread (OAS) June 2012 – June 2013



Barclays US Corporate High Yield Index Yield-to-Worst 2003 – 2013



Barclays US Corporate High Yield Index Yield-to-Worst June 2012 – June 2013



Emerging Market Debt

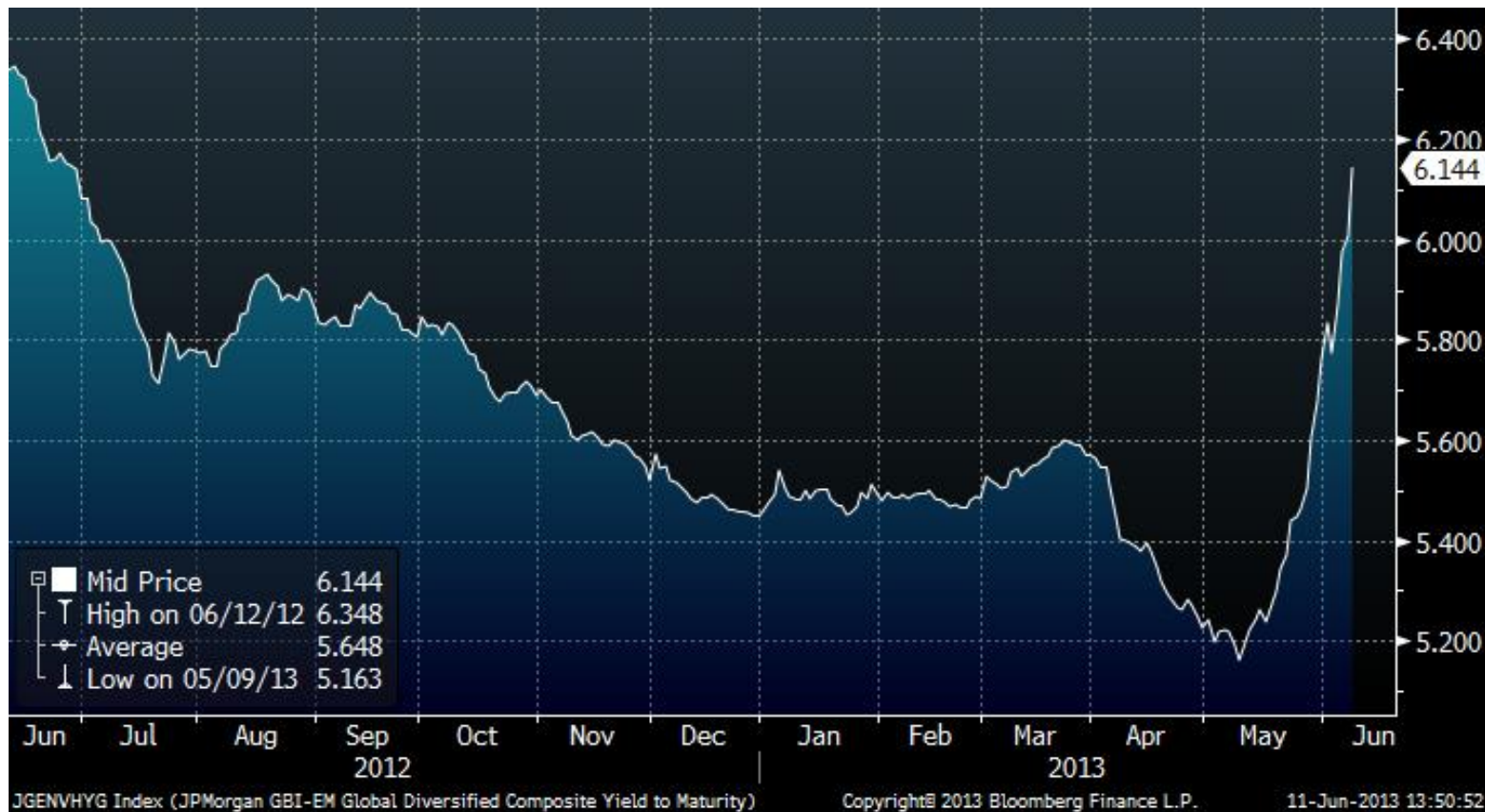
Yield of JPM GBI-EM Global Diversified Index 2003 – 2013



The JPM GBI-EM Global Diversified Index tracks the returns of local currency emerging market sovereign debt. This index is the benchmark for ASRS's emerging market debt asset class.

Yield of JPM GBI-EM Global Diversified Index

June 2012 – June 2013



The JPM GBI-EM Global Diversified Index tracks the returns of local currency emerging market sovereign debt. This index is the benchmark for ASRS's emerging market debt asset class.

JPM Emerging Local Markets Index Plus (ELMI+) 2003-2013



The JP Morgan Emerging Local Markets Index Plus (ELMI+) tracks total returns for local-currency denominated money market instruments for 23 emerging markets countries. The ELMI+ is a barometer of changes in the value of emerging market currencies relative to the US dollar.

JPM Emerging Local Markets Index Plus (ELMI+)

June 2012 – June 2013



The JP Morgan Emerging Local Markets Index Plus (ELMI+) tracks total returns for local-currency denominated money market instruments for 23 emerging markets countries. The ELMI+ is a barometer of changes in the value of emerging market currencies relative to the US dollar.

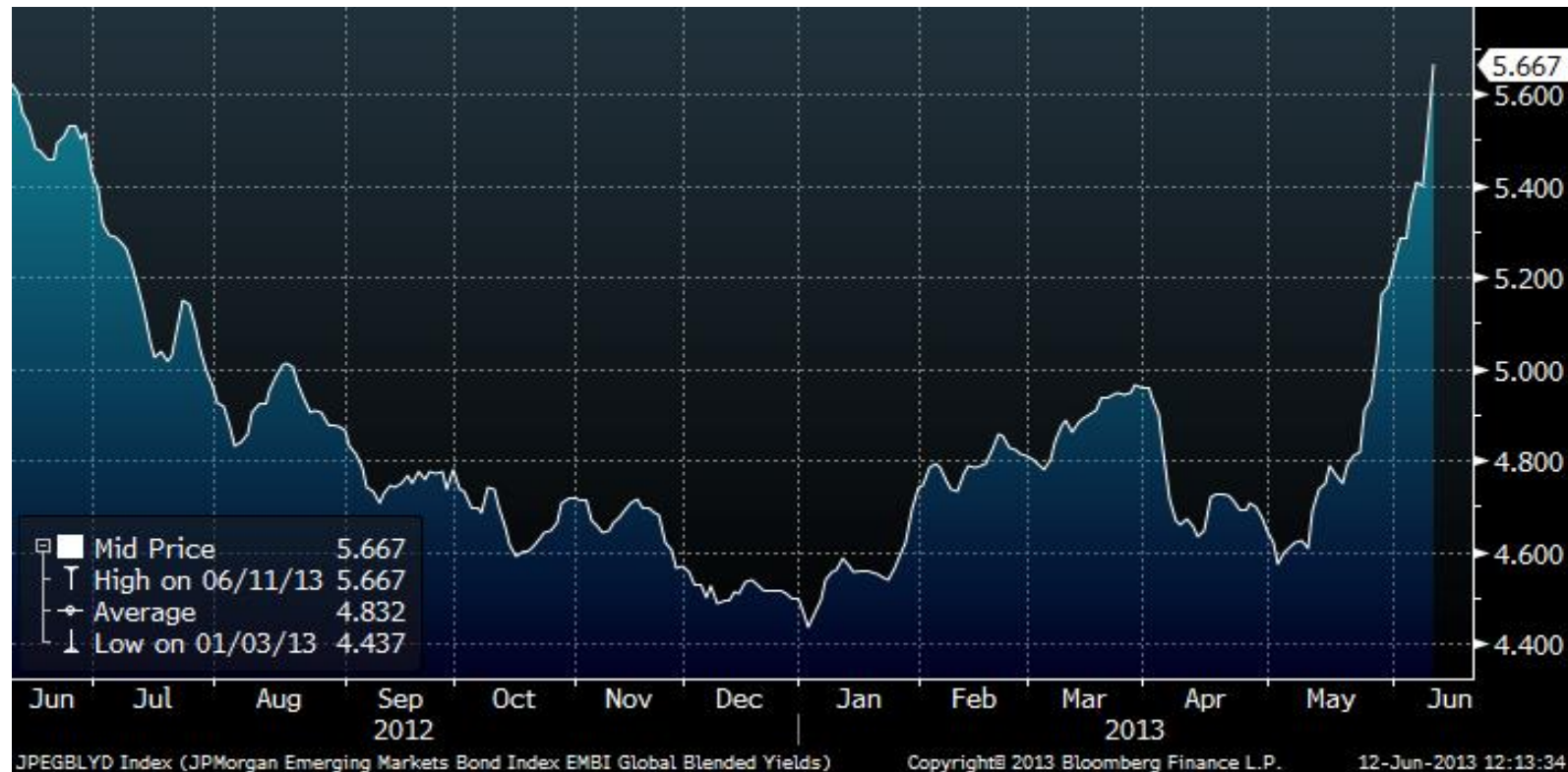
Yield of JPM EMBI Global Diversified Index (EMBI-GD) 2003 - 2013



The JP Morgan EMBI Global Diversified Index (EMBI-GD) tracks total returns for US dollar denominated debt instruments of sovereign and quasi sovereign entities of emerging market countries. This index is included as part of the manager benchmark for the Ashmore blended mandate.

Yield of JPM EMBI Global Diversified Index (EMBI-GD)

June 2003 – June 2013



The JP Morgan EMBI Global Diversified Index (EMBI-GD) tracks total returns for US dollar denominated debt instruments of sovereign and quasi sovereign entities of emerging market countries. This index is included as part of the manager benchmark for the Ashmore blended mandate.

Yield of JPM Corporate Emerging Markets Bond Index Broad Diversified (CEMBI BD) 2003 - 2013



The JP Morgan Corporate Emerging Markets Bond Index Broad Diversified (CEMBI BD) tracks total returns for US dollar denominated debt instruments of corporate entities in emerging market countries. This index is included as part of the manager benchmark for the Ashmore blended mandate.

Yield of JPM Corporate Emerging Markets Bond Index Broad Diversified (CEMBI BD) June 2003 – June 2013



The JP Morgan Corporate Emerging Markets Bond Index Broad Diversified (CEMBI BD) tracks total returns for US dollar denominated debt instruments of corporate entities in emerging market countries. This index is included as part of the manager benchmark for the Ashmore blended mandate.

Excess Returns

Broad sector excess returns

Barclays Fixed Income Indices relative to Treasuries (excess return) 1998–2013

	U.S. Agency	U.S. MBS	ABS	CMBS	U.S. Credit	U.S. Intermediate Credit	U.S. Long Credit	U.S. High Yield	EMD
Quality Ranking	High	High	High	High	Medium	Medium	Medium	Low	Low
1998	-49	-90	-88	n/a	-238	-150	-381	-843	-2046
1999	41	113	137	87	170	164	182	476	2417
2000	-13	-77	43	-41	-463	-237	-1003	-1897	148
2001	73	-75	139	131	277	138	667	-285	-541
2002	96	173	-16	210	-187	-129	-371	-1329	23
2003	27	11	181	201	527	439	824	2642	2465
2004	78	142	142	118	159	151	190	800	823
2005	13	-37	32	15	-85	-25	-291	47	959
2006	75	122	87	137	119	107	156	843	702
2007	-52	-185	-634	-435	-464	-399	-655	-777	-457
2008	-110	-255	-2223	-3274	-1786	-1504	-2719	-3832	-2842
2009	238	482	2496	2960	1990	1707	2880	5955	3797
2010	72	230	169	1501	192	212	124	974	508
2011	19	-113	52	47	-322	-197	-696	-240	-537
2012	97	91	246	841	693	614	898	1394	1503
YTD	-1	-64	4	38	77	71	92	468	-74

Source: Barclays. The above table is shown for illustrative purposes only. YTD through May 31, 2013

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APPENDIX 2

CORRELATIONS BETWEEN VARIOUS FIXED INCOME ASSET CLASSES

Correlations between Various Fixed Income Asset Classes

10 YEAR CORRELATIONS, MONTHLY

	JPM EMBI GLOBAL	JPM ELMI+ UNHEDGED	JPM GBI-EM GLOBAL DIV UNHEDGED*	JPM CEMBI DIV	U.S. TREASURY	BAGG	HIGH GRADE	HIGH YIELD	U.S. TIPS**	FOREIGN HEDGED	FOREIGN UNHEDGED	S&P 500 Total return	EM Equity	DJ UBS COMMODITY
JPM EMBI GLOBAL	1.00													
JPM ELMI+ UNHEDGED	0.68	1.00												
JPM GBI-EM GLOBAL DIV UNHEDGED*	0.78	0.94	1.00											
JPM CEMBI DIV	0.92	0.62	0.72	1.00										
U.S. TREASURY	0.28	-0.02	0.08	0.28	1.00									
BAGG	0.62	0.23	0.36	0.63	0.88	1.00								
HIGH GRADE	0.79	0.42	0.55	0.83	0.57	0.87	1.00							
HIGH YIELD	0.76	0.61	0.66	0.73	-0.21	0.23	0.58	1.00						
U.S. TIPS	0.63	0.35	0.42	0.65	0.64	0.78	0.71	0.35	1.00					
FOREIGN HEDGED	0.21	-0.07	0.06	0.18	0.77	0.69	0.48	-0.18	0.41	1.00				
FOREIGN UNHEDGED	0.47	0.56	0.56	0.43	0.55	0.62	0.56	0.22	0.59	0.47	1.00			
S&P 500 TOTAL RETURN	0.57	0.71	0.69	0.54	-0.28	0.01	0.29	0.72	0.14	-0.28	0.17	1.00		
EM EQUITY	0.65	0.80	0.80	0.61	-0.23	0.08	0.36	0.71	0.23	-0.22	0.25	0.82	1.00	
DJ UBS COMMODITY	0.43	0.62	0.54	0.45	-0.11	0.07	0.27	0.45	0.35	-0.21	0.33	0.46	0.61	1.00

As of 31 December 2012

SOURCE: PIMCO, JPMorgan, Barclays, BofA Merrill Lynch, Morgan Stanley

* JPMorgan GBI-EM Global Diversified Index Unhedged: Since 31 December 2002

** Treasury Inflation Protected Treasuries (TIPS)

U.S. Treasury is represented by the Citigroup U.S. Treasury Index; BAGG is the Barclays U.S. Aggregate Index; High Grade is represented by the Barclays U.S. Credit Investment Grade Index; High Yield is represented by the BofA Merrill Lynch High Yield Master II Index; U.S. TIPS is represented by the Barclays U.S. TIPS Index; Foreign Hedged is represented by the JPMorgan GBI Global Ex-U.S. Hedged Index; Foreign Unhedged is represented by the JPMorgan Non-U.S. Government Bond Index Unhedged; EM Equity is represented by MSCI Emerging Markets Total Return Net Index.

Refer to Appendix for additional correlation, investment strategy, index and risk information.

APPENDIX 3
ASRS STRATEGIC ASSET ALLOCATION
POLICY SCHEMATIC

ASRS Strategic Asset Allocation Policy Schematic

Asset Class	Policy	Range	Benchmark	Passive %
Large Cap	23%		S&P 500	
Mid Cap	5%		S&P 400	
Small Cap	<u>5%</u>		S&P 600	
US Equity	33%	(26 - 38%)		Min 50%
Developed Large Cap	14%		MSCI EAFE	
Developed Small Cap	3%		MSCI EAFE Small Cap	
Emerging Markets	<u>6%</u>		MSCI EM	
Non-US Equity	23%	(16 - 28%)		Min 30%
Private Equity	7%	(5 - 9%)	Russell 2000	
Opportunistic Equity*	<u>0%</u>	(0 - 3%)	Investment Specific	
Total Equity	63%	(53 - 70%)		
Core	13%		Barclays Aggregate	Min 50%
High Yield	<u>5%</u>		Barclays HY	
US Fixed Income	18%	(8 - 28%)		
Emerging Market Debt	4%		JP Morgan GBI-EM Global Diversified	
Opportunistic Debt*	0%	(0 - 10%)	Investment Specific	
Private Debt	<u>3%</u>		S&P /LSTA Leveraged Loan Index + 2.5%	
Total Fixed Income	25%	(15 - 35%)		
Commodities	4%	(1 - 7%)	DJ UBS Total Return	
Real Estate	8%	(6 - 10%)	NCREIF ODCE	
Infrastructure	0%	(0 - 3%)	CPI (ex food and energy) + 3.5%	
Farmland and Timber	0%	(0 - 3%)	CPI (ex food and energy) + 3.5%	
Opportunistic Inflation Linked*	<u>0%</u>	(0 - 3%)	Investment Specific	
Total Inflation Linked Assets	12%	(8 - 16%)		
TOTAL	100%			
Global Tactical Asset Allocation (GTAA)	10%	(5 - 15%)	Total Fund Benchmark	
*Note: Aggregate Opportunistic asset classes not to exceed 10%				

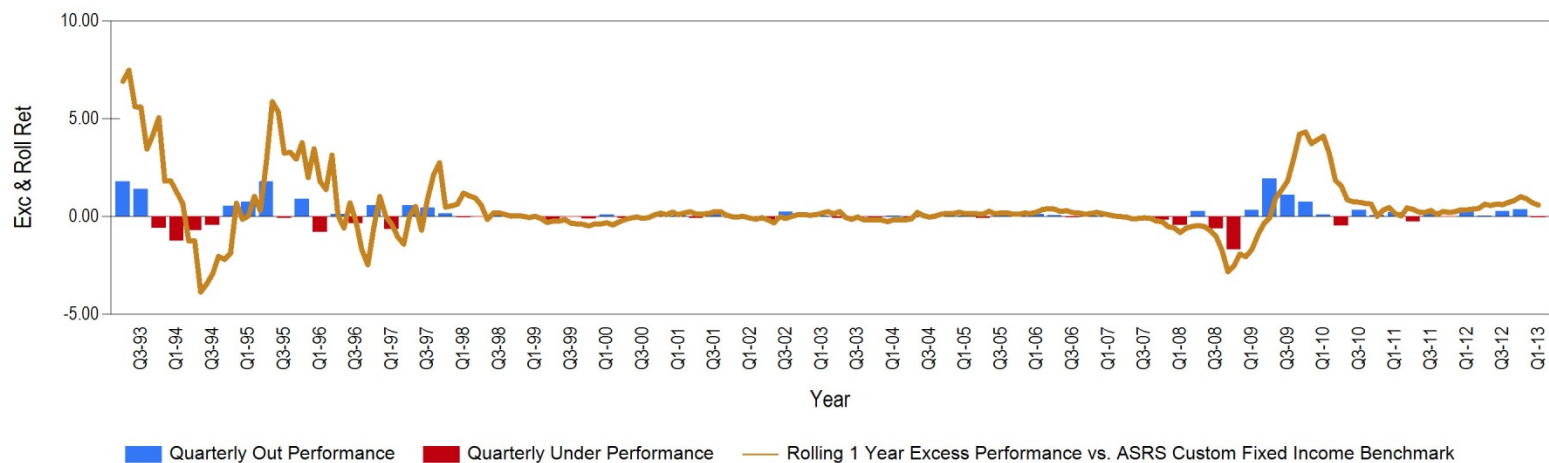
Approved by the ASRS Board: May 24, 2013

APPENDIX 4
NEPC SUMMARY OF PUBLIC MANAGERS'
PERFORMANCE

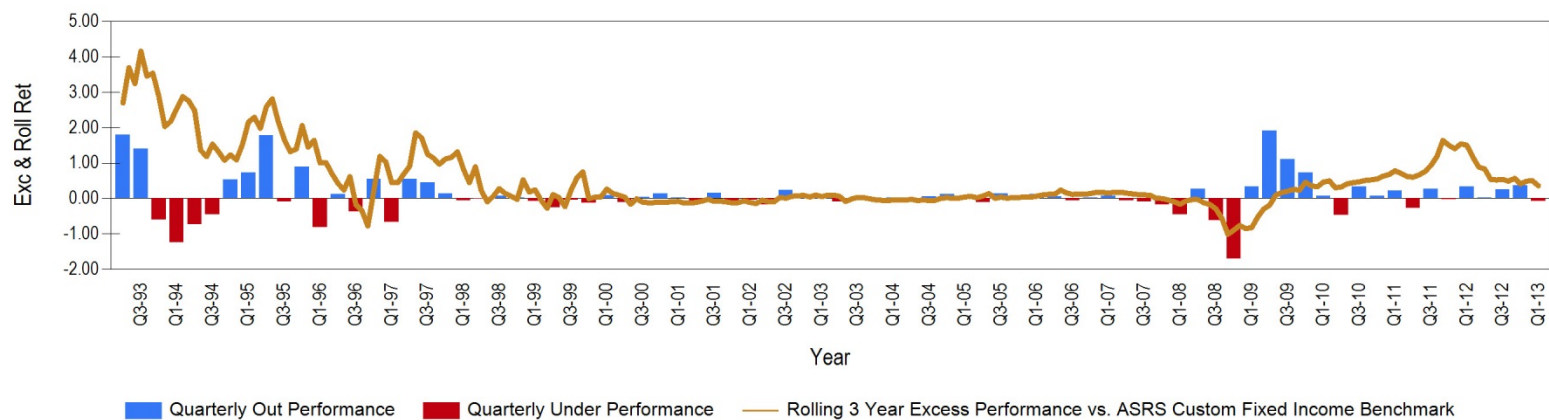
Arizona State Retirement System

Total Fixed Income Rolling Excess Returns

Rolling 1 Year Annualized Excess Returns Since April 01, 1993



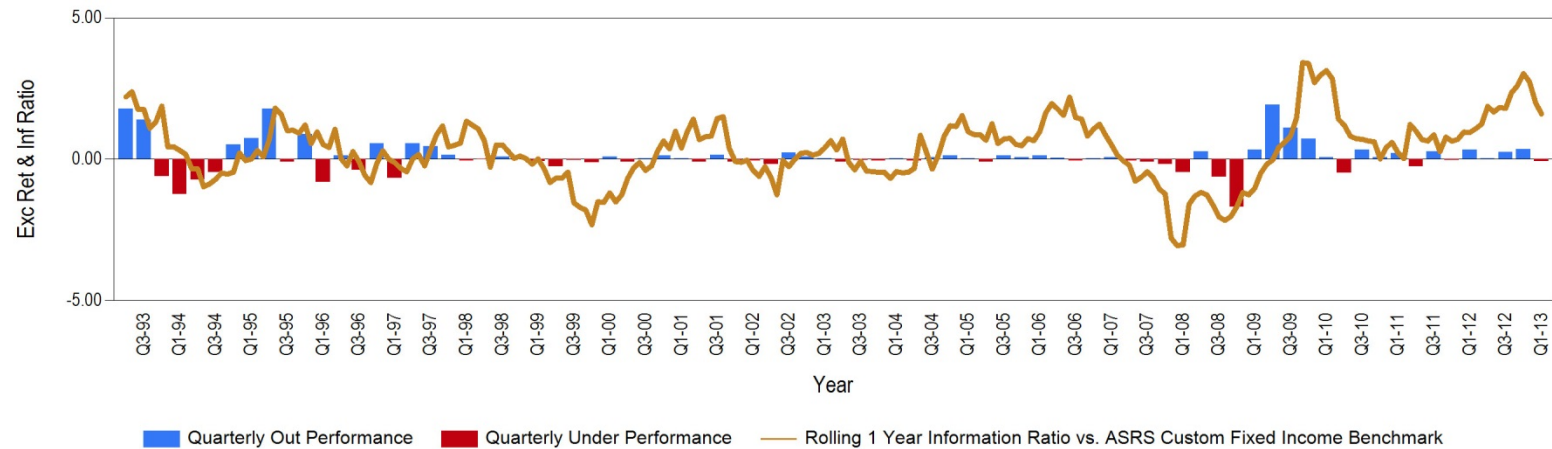
Rolling 3 Year Annualized Excess Returns Since April 01, 1993



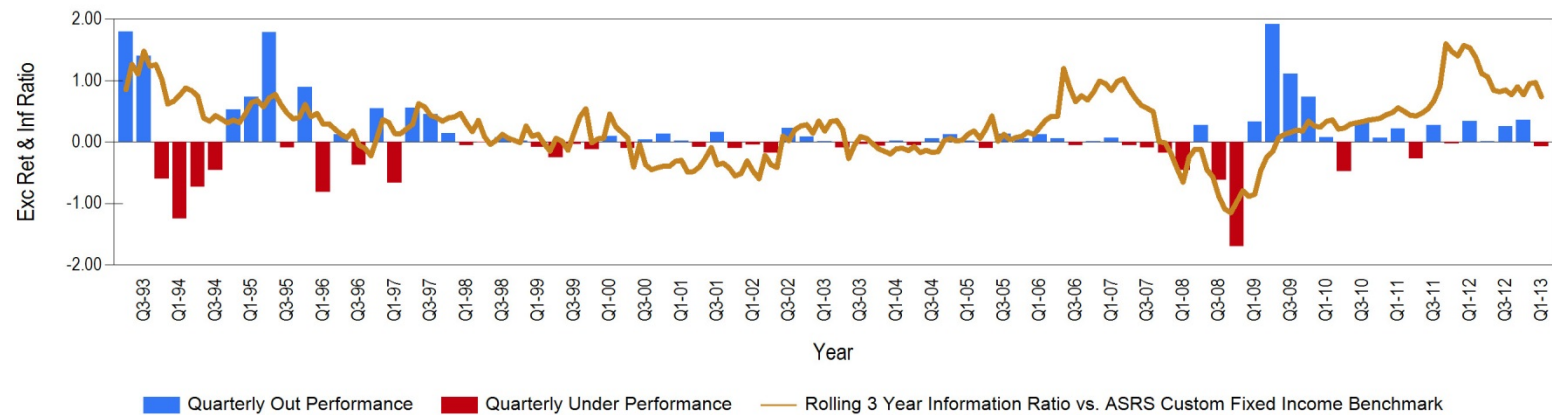
Arizona State Retirement System

Total Fixed Income Rolling Information Ratios

Rolling 1 Year Information Ratio Since April 01, 1993



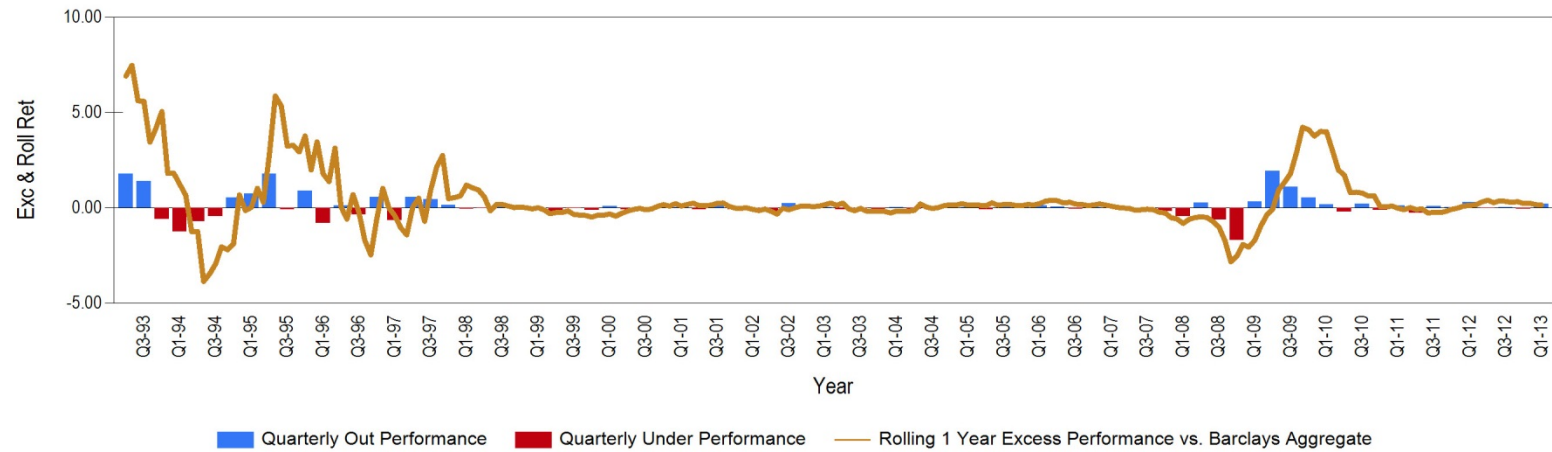
Rolling 3 Year Information Ratio Since April 01, 1993



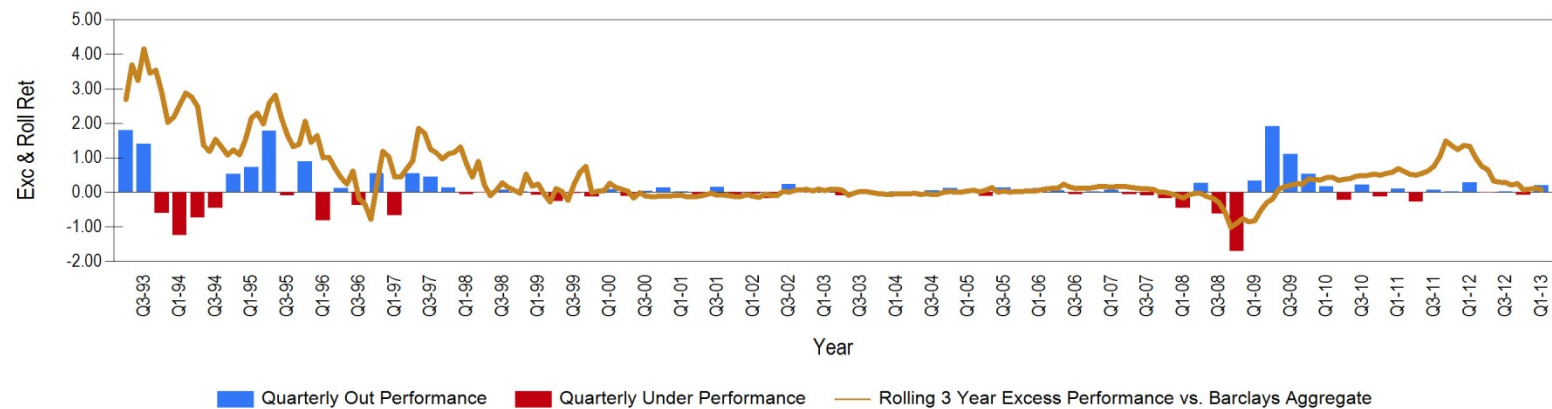
Arizona State Retirement System

Total Core Fixed Income Rolling Excess Returns

Rolling 1 Year Annualized Excess Returns Since April 01, 1993



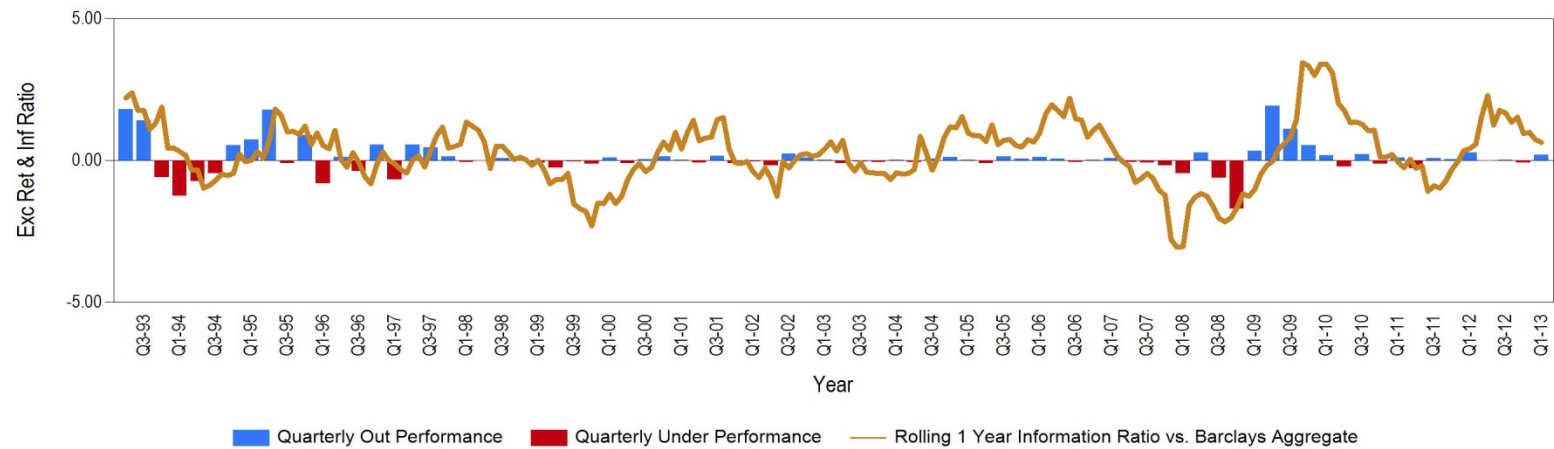
Rolling 3 Year Annualized Excess Returns Since April 01, 1993



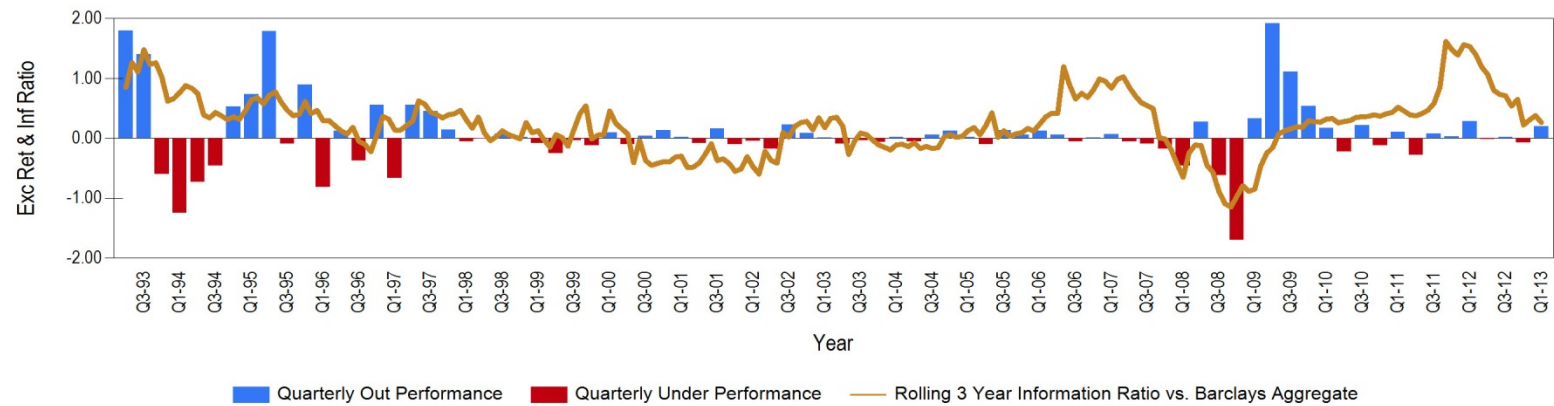
Arizona State Retirement System

Total Core Fixed Income Rolling Information Ratios

Rolling 1 Year Information Ratio Since April 01, 1993



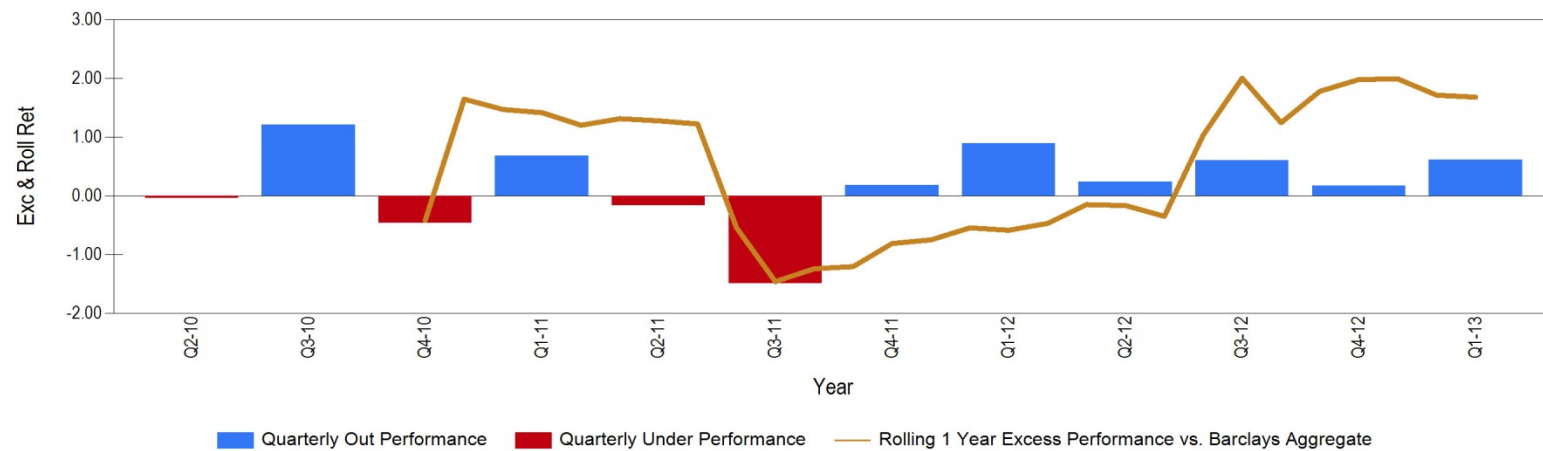
Rolling 3 Year Information Ratio Since April 01, 1993



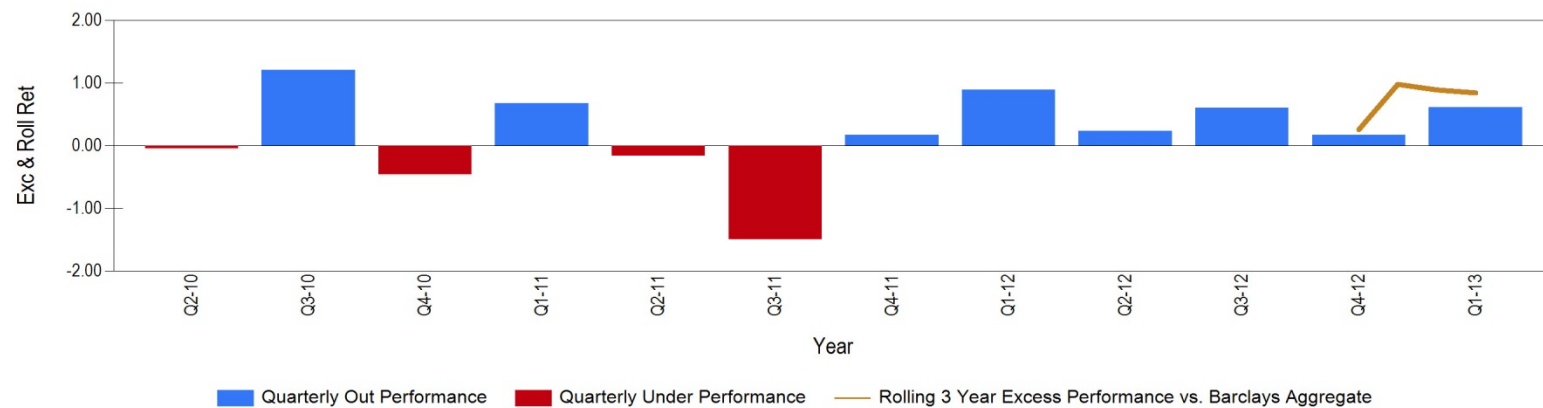
Arizona State Retirement System

PIMCO Rolling Excess Returns

Rolling 1 Year Annualized Excess Returns Since Inception (February 01, 2010)



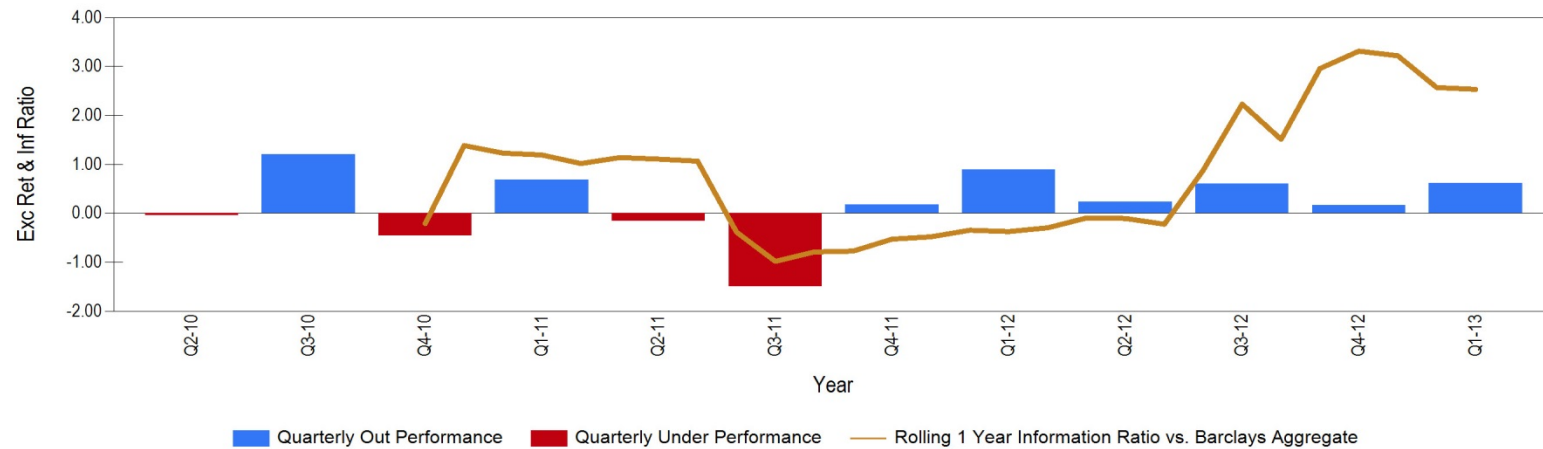
Rolling 3 Year Annualized Excess Returns Since Inception (February 01, 2010)



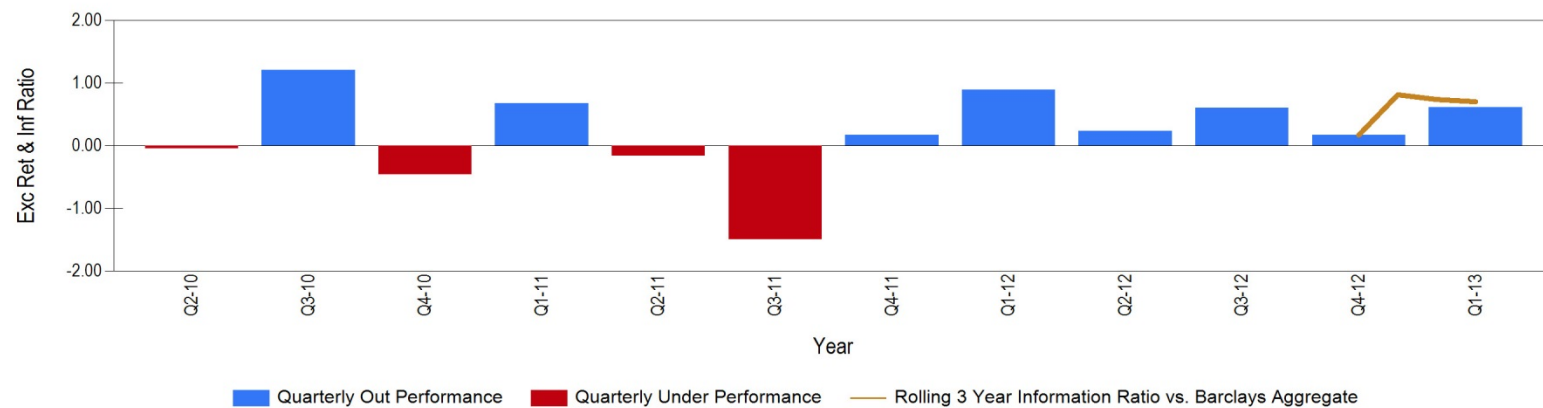
Arizona State Retirement System

PIMCO Rolling Information Ratios

Rolling 1 Year Information Ratio Since Inception (February 01, 2010)



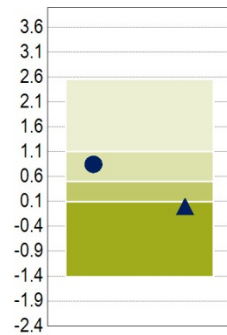
Rolling 3 Year Information Ratio Since Inception (February 01, 2010)



Arizona State Retirement System

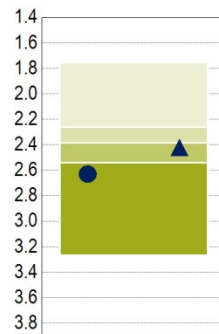
PIMCO - Three-Year Risk/Return Characteristics vs. eA US Core Fixed Inc Net Universe

Annualized Excess Return



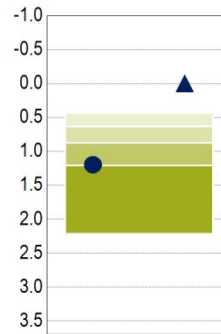
● PIMCO	
Value	0.8
%tile	31
▲ Barclays Aggregate	
Value	0.0
%tile	83
Universe	
5th %tile	2.5
25th %tile	1.1
Median	0.5
75th %tile	0.1
95th %tile	-1.4

Annualized Standard Deviation



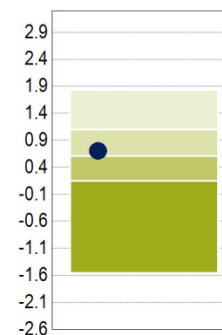
● PIMCO	
Value	2.6
%tile	84
▲ Barclays Aggregate	
Value	2.4
%tile	64
Universe	
5th %tile	1.8
25th %tile	2.3
Median	2.4
75th %tile	2.5
95th %tile	3.3

Tracking Error



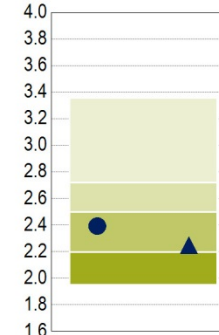
● PIMCO	
Value	1.2
%tile	75
▲ Barclays Aggregate	
Value	0.0
%tile	1
Universe	
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25th %tile	0.6
Median	0.9
75th %tile	1.2
95th %tile	2.2

Information Ratio



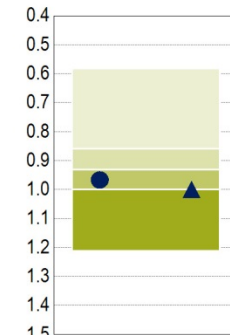
● PIMCO	
Value	0.7
%tile	49
▲ Barclays Aggregate	
Value	--
%tile	--
Universe	
5th %tile	1.8
25th %tile	1.1
Median	0.6
75th %tile	0.2
95th %tile	-1.6

Sharpe Ratio



● PIMCO	
Value	2.4
%tile	60
▲ Barclays Aggregate	
Value	2.2
%tile	71
Universe	
5th %tile	3.4
25th %tile	2.7
Median	2.5
75th %tile	2.2
95th %tile	2.0

Beta

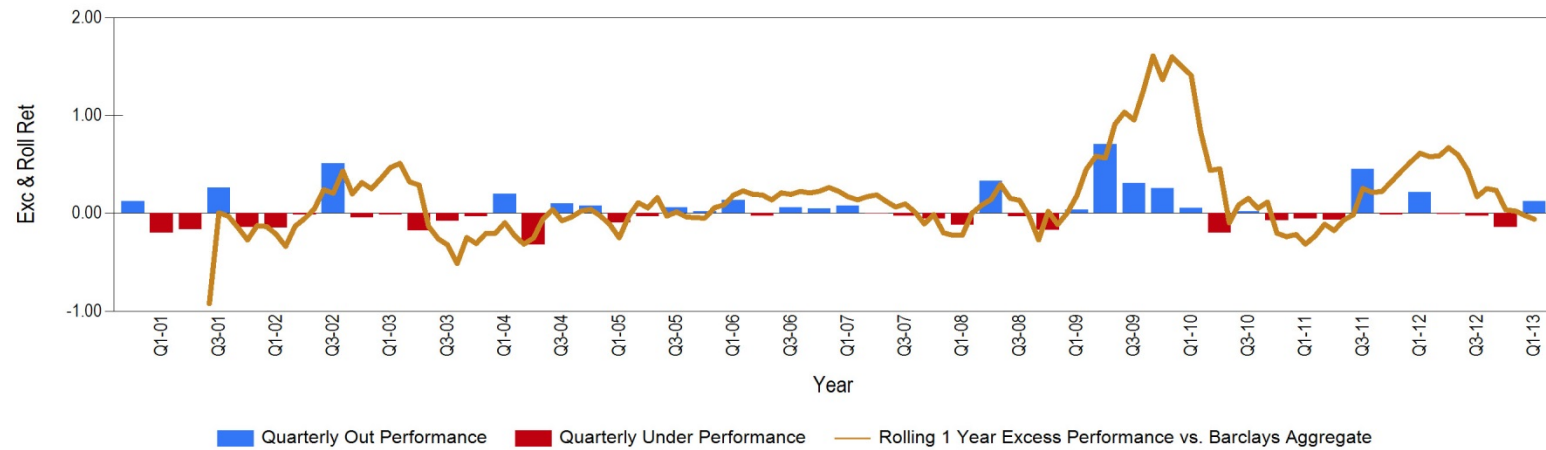


● PIMCO	
Value	1.0
%tile	64
▲ Barclays Aggregate	
Value	1.0
%tile	77
Universe	
5th %tile	0.6
25th %tile	0.9
Median	0.9
75th %tile	1.0
95th %tile	1.2

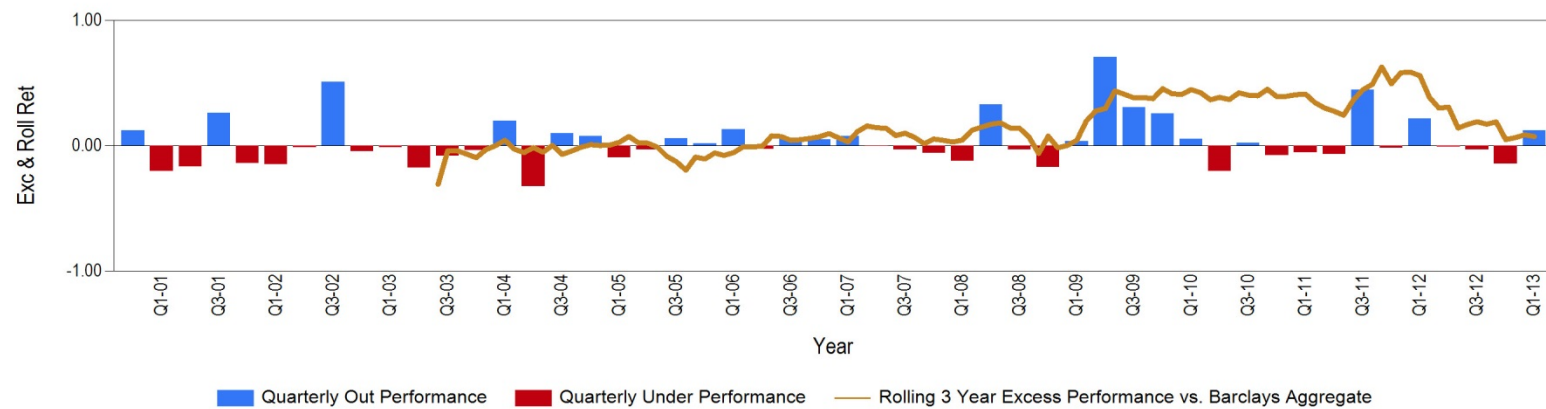
Arizona State Retirement System

Internally Managed F2 Rolling Excess Returns

Rolling 1 Year Annualized Excess Returns Since Inception (October 01, 2000)



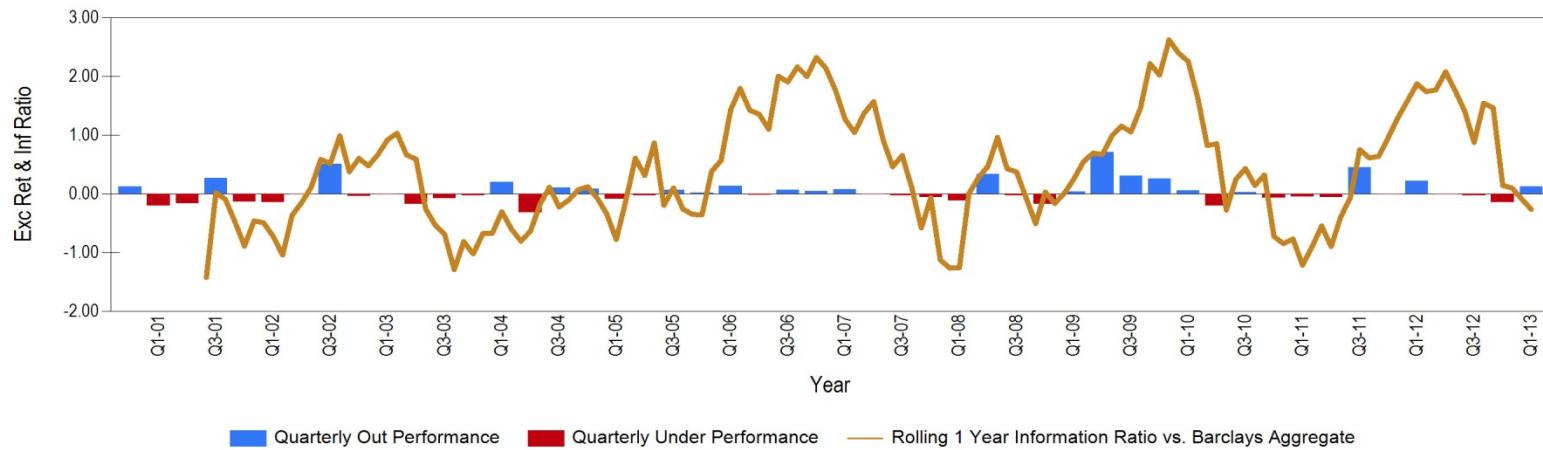
Rolling 3 Year Annualized Excess Returns Since Inception (October 01, 2000)



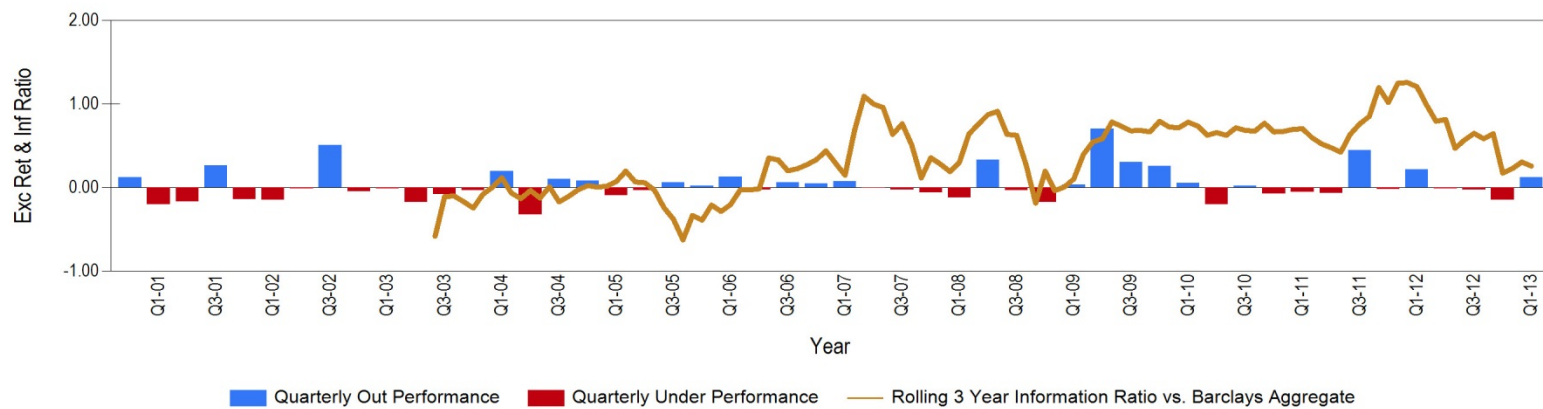
Arizona State Retirement System

Internally Managed F2 Rolling Information Ratios

Rolling 1 Year Information Ratio Since Inception (October 01, 2000)



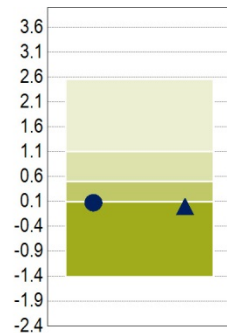
Rolling 3 Year Information Ratio Since Inception (October 01, 2000)



Arizona State Retirement System

Internally Managed F2 - Three-Year Risk/Return Characteristics vs. eA US Core Fixed Inc Net Universe

Annualized Excess Return



● Internally Managed F2

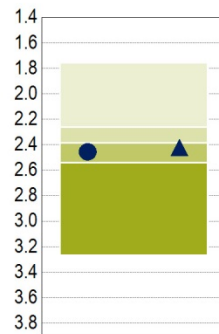
Value 0.1
%tile 77

▲ Barclays Aggregate

Value 0.0
%tile 83

Universe
5th %tile 2.5
25th %tile 1.1
Median 0.5
75th %tile 0.1
95th %tile -1.4

Annualized Standard Deviation



● Internally Managed F2

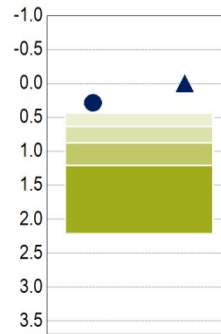
Value 2.5
%tile 67

▲ Barclays Aggregate

Value 2.4
%tile 64

Universe
5th %tile 1.8
25th %tile 2.3
Median 2.4
75th %tile 2.5
95th %tile 3.3

Tracking Error



● Internally Managed F2

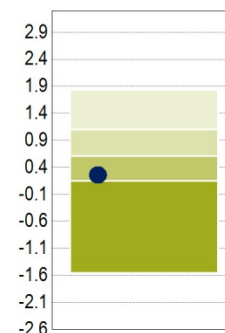
Value 0.3
%tile 1

▲ Barclays Aggregate

Value 0.0
%tile 1

Universe
5th %tile 0.4
25th %tile 0.6
Median 0.9
75th %tile 1.2
95th %tile 2.2

Information Ratio



● Internally Managed F2

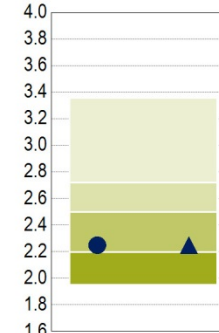
Value 0.3
%tile 70

▲ Barclays Aggregate

Value --
%tile --

Universe
5th %tile 1.8
25th %tile 1.1
Median 0.6
75th %tile 0.2
95th %tile -1.6

Sharpe Ratio



● Internally Managed F2

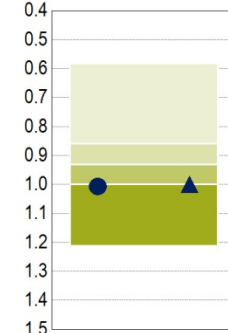
Value 2.2
%tile 71

▲ Barclays Aggregate

Value 2.2
%tile 71

Universe
5th %tile 3.4
25th %tile 2.7
Median 2.5
75th %tile 2.2
95th %tile 2.0

Beta



● Internally Managed F2

Value 1.0
%tile 78

▲ Barclays Aggregate

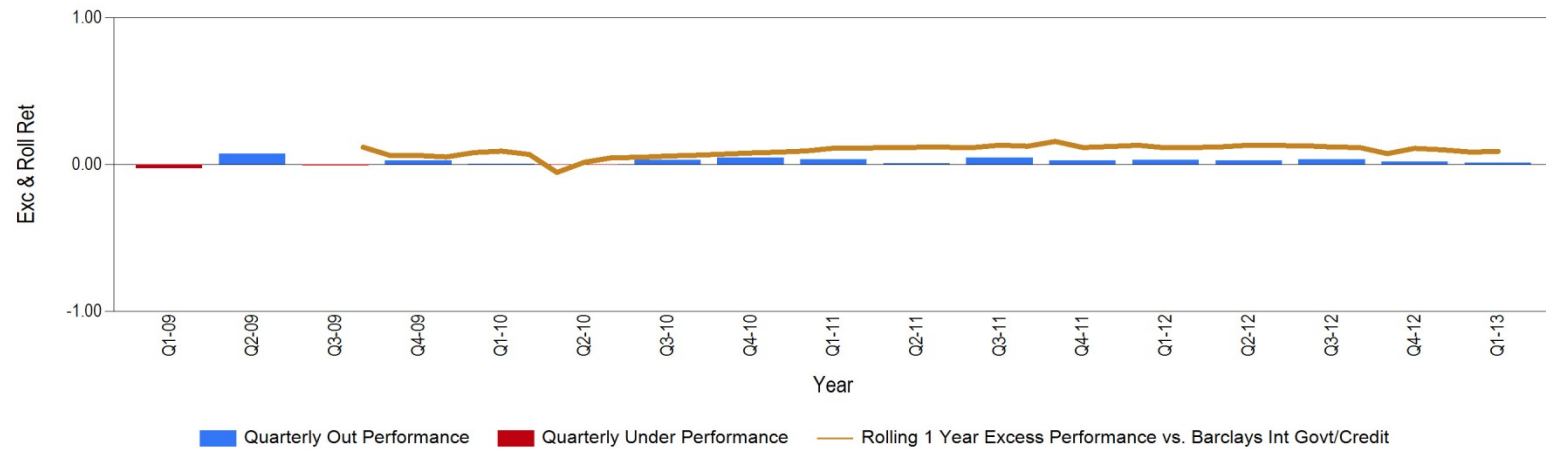
Value 1.0
%tile 77

Universe
5th %tile 0.6
25th %tile 0.9
Median 0.9
75th %tile 1.0
95th %tile 1.2

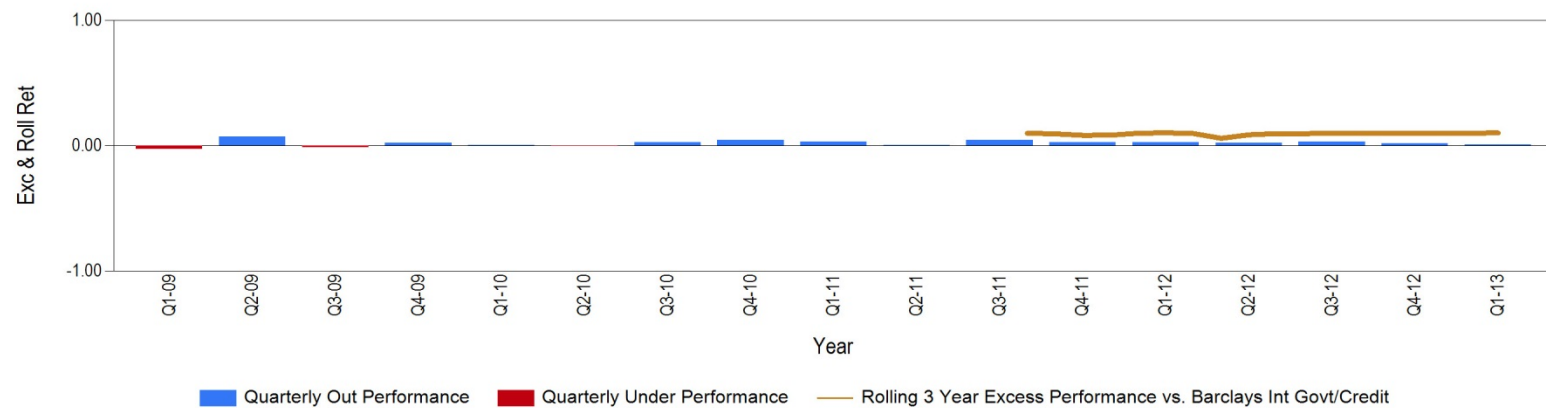
Arizona State Retirement System

BlackRock Intermediate Gov't/Credit Bond Index Rolling Excess Returns

Rolling 1 Year Annualized Excess Returns Since Inception (November 01, 2008)



Rolling 3 Year Annualized Excess Returns Since Inception (November 01, 2008)



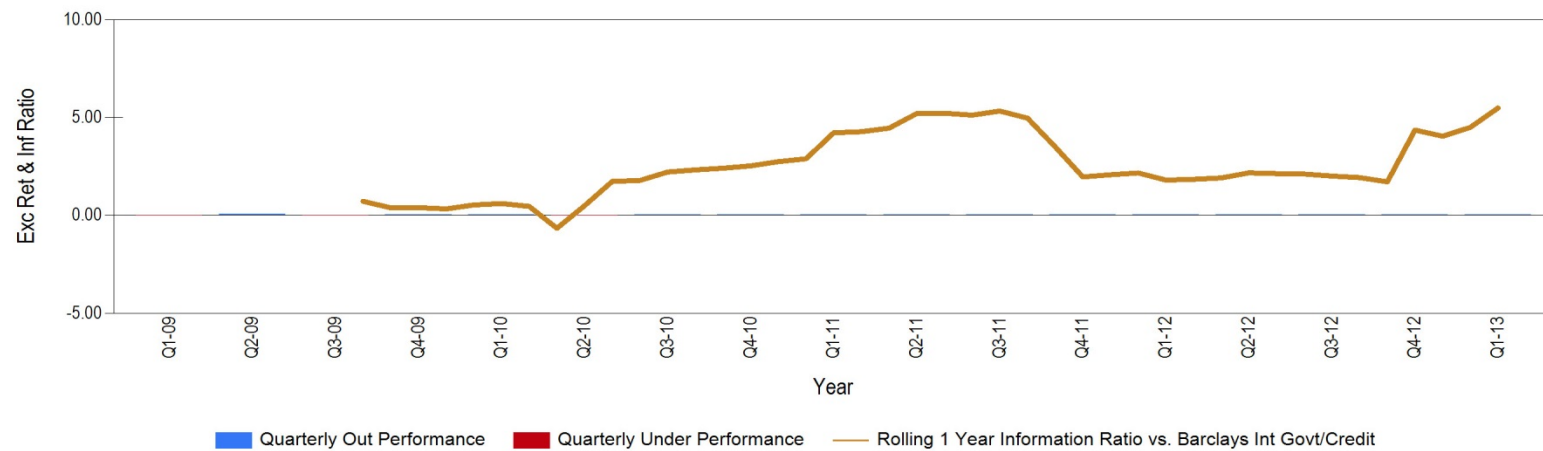
NEPC, LLC

March 31, 2013

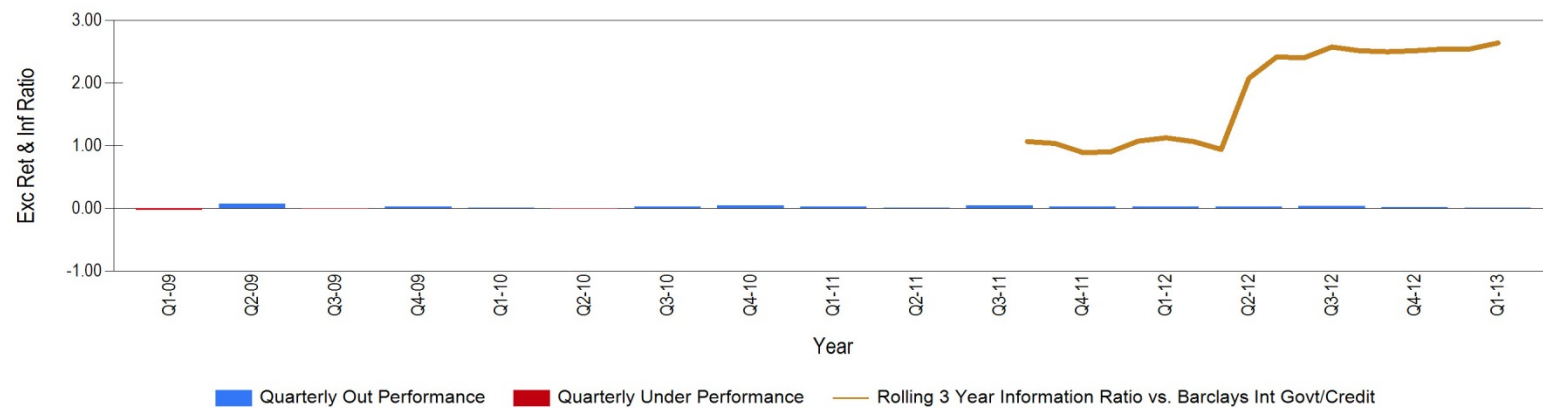
Arizona State Retirement System

BlackRock Intermediate Gov't/Credit Bond Index Rolling Information Ratios

Rolling 1 Year Information Ratio Since Inception (November 01, 2008)



Rolling 3 Year Information Ratio Since Inception (November 01, 2008)



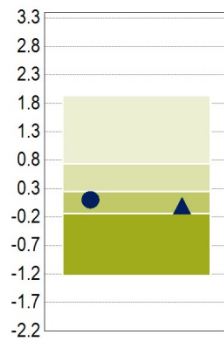
NEPC, LLC

March 31, 2013

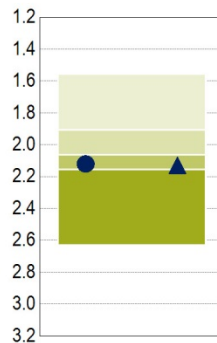
Arizona State Retirement System

BlackRock Intermediate Gov't/Credit Bond Index - Three-Year Risk/Return Characteristics vs. eA US Interm Duration Fixed Inc Net Universe

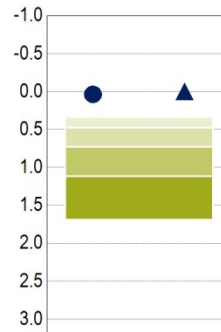
Annualized Excess Return



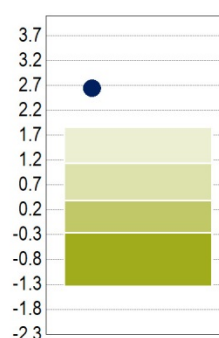
Annualized Standard Deviation



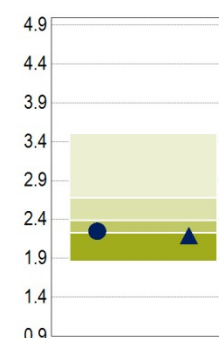
Tracking Error



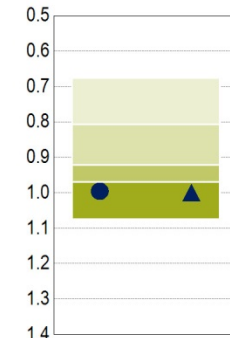
Information Ratio



Sharpe Ratio



Beta

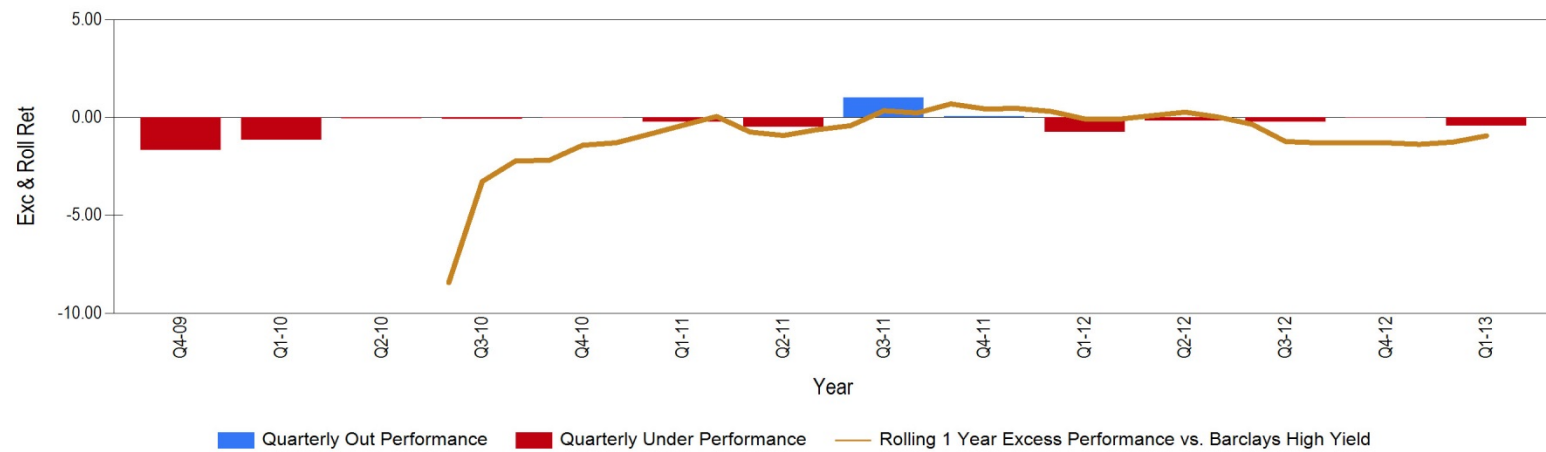


BlackRock Intermediate Gov't/Credit	BlackRock Intermediate Gov't/Credit	BlackRock Intermediate Gov't/Credit	BlackRock Intermediate Gov't/Credit	BlackRock Intermediate Gov't/Credit	BlackRock Intermediate Gov't/Credit
Value 0.1	Value 2.1	Value 0.0	Value 2.6	Value 2.2	Value 1.0
%tile 63	%tile 69	%tile 1	%tile 1	%tile 72	%tile 87
Barclays Int Govt/Credit	Barclays Int Govt/Credit	Barclays Int Govt/Credit	Barclays Int Govt/Credit	Barclays Int Govt/Credit	Barclays Int Govt/Credit
Value 0.0	Value 2.1	Value 0.0	Value --	Value 2.2	Value 1.0
%tile 67	%tile 69	%tile 1	%tile --	%tile 81	%tile 89
Universe	Universe	Universe	Universe	Universe	Universe
5th %tile 1.9	5th %tile 1.6	5th %tile 0.3	5th %tile 1.9	5th %tile 3.5	5th %tile 0.7
25th %tile 0.7	25th %tile 1.9	25th %tile 0.5	25th %tile 1.1	25th %tile 2.7	25th %tile 0.8
Median 0.3	Median 2.1	Median 0.7	Median 0.4	Median 2.4	Median 0.9
75th %tile -0.1	75th %tile 2.2	75th %tile 1.1	75th %tile -0.2	75th %tile 2.2	75th %tile 1.0
95th %tile -1.2	95th %tile 2.6	95th %tile 1.7	95th %tile -1.3	95th %tile 1.9	95th %tile 1.1

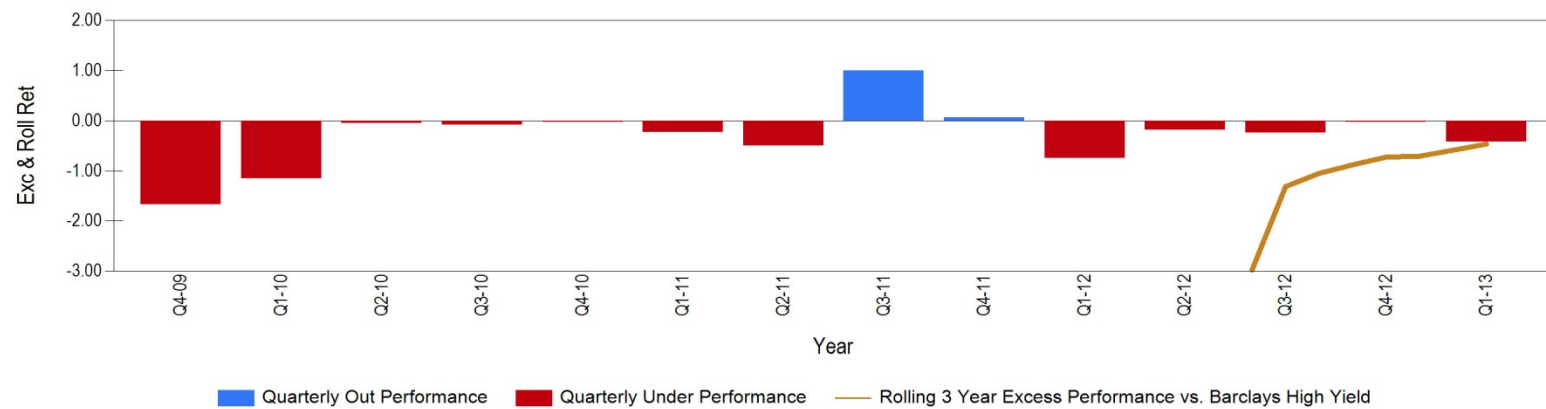
Arizona State Retirement System

Total High Yield Fixed Income Rolling Excess Returns

Rolling 1 Year Annualized Excess Returns Since Inception (October 01, 2009)



Rolling 3 Year Annualized Excess Returns Since Inception (October 01, 2009)



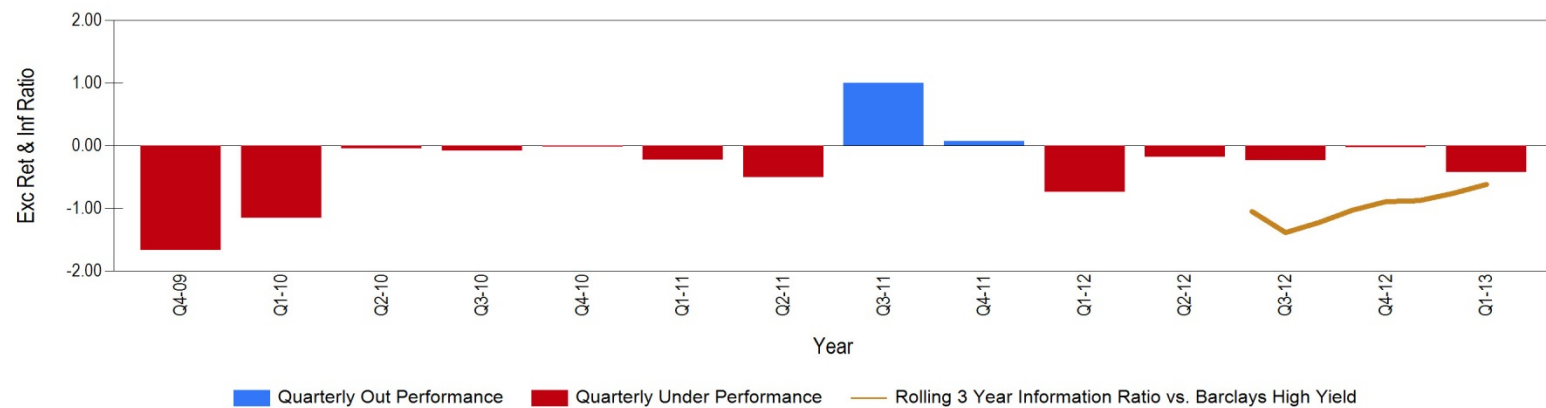
Arizona State Retirement System

Total High Yield Fixed Income Rolling Information Ratios

Rolling 1 Year Information Ratio Since Inception (October 01, 2009)



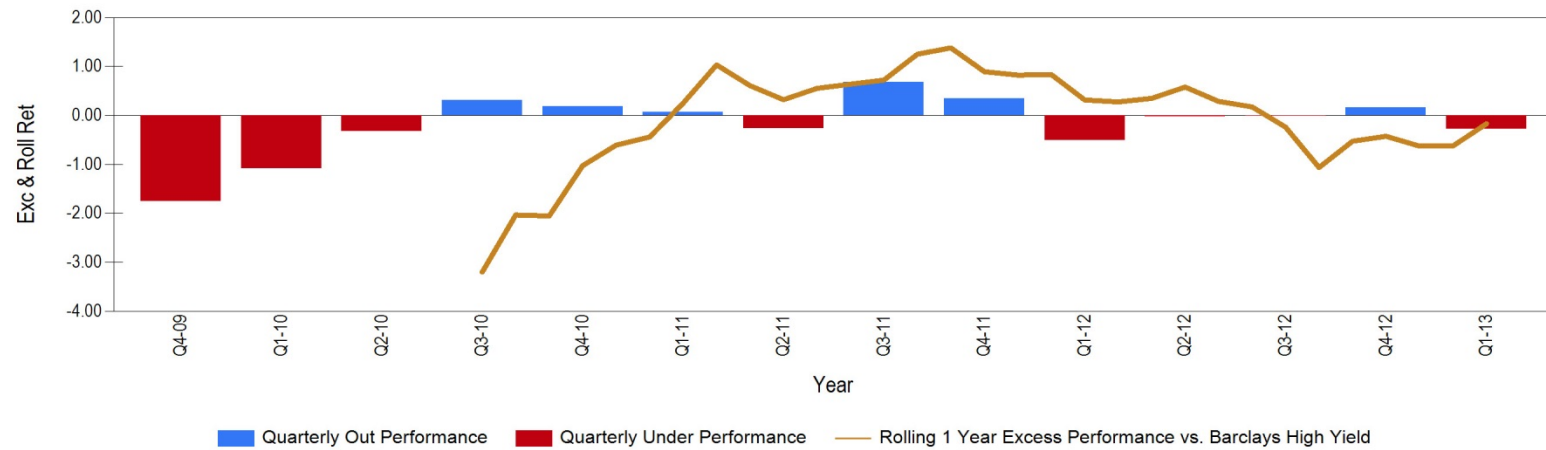
Rolling 3 Year Information Ratio Since Inception (October 01, 2009)



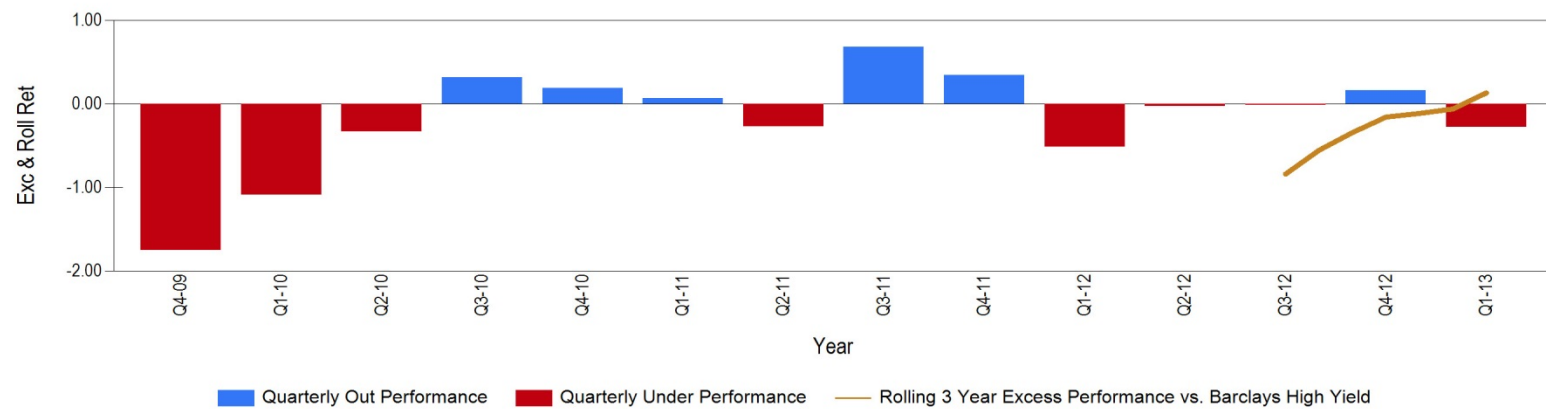
Arizona State Retirement System

Columbia Management Rolling Excess Returns

Rolling 1 Year Annualized Excess Returns Since Inception (October 01, 2009)



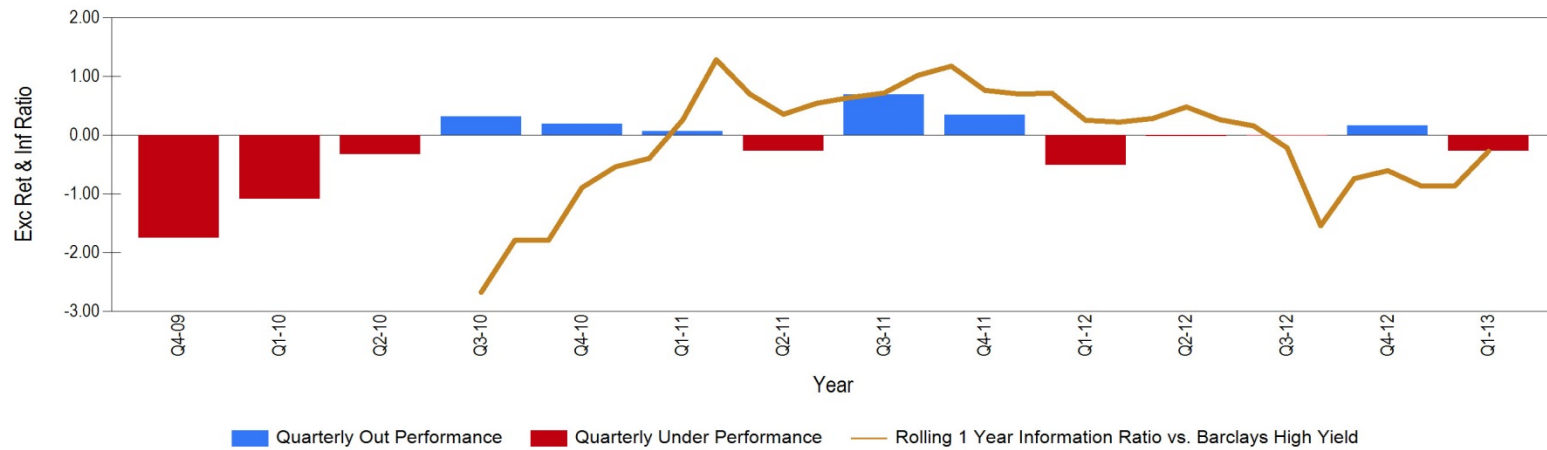
Rolling 3 Year Annualized Excess Returns Since Inception (October 01, 2009)



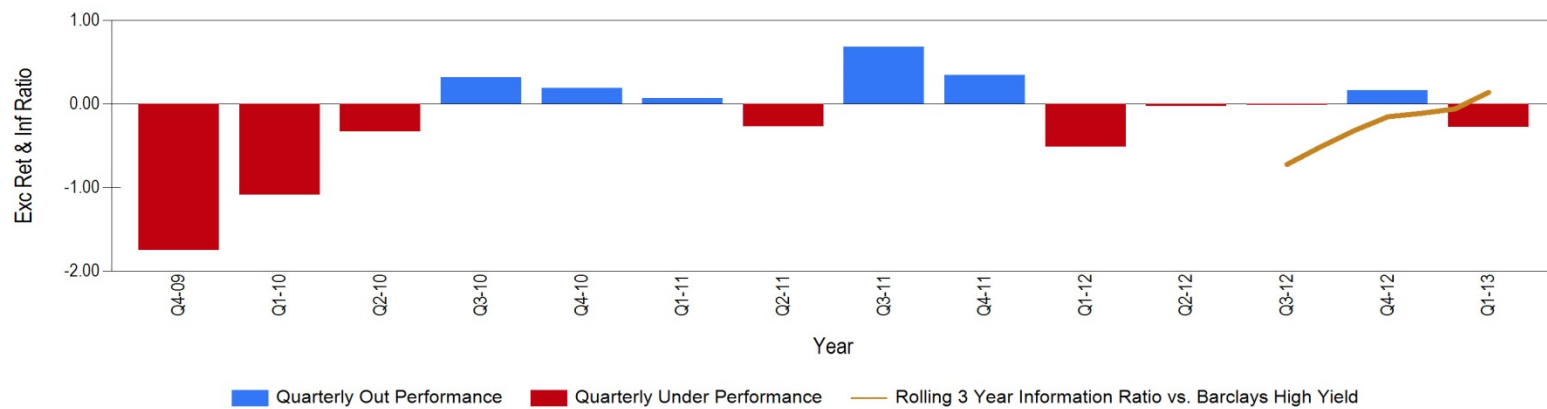
Arizona State Retirement System

Columbia Management Rolling Information Ratios

Rolling 1 Year Information Ratio Since Inception (October 01, 2009)



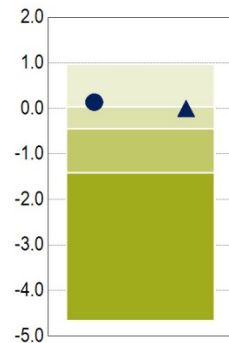
Rolling 3 Year Information Ratio Since Inception (October 01, 2009)



Arizona State Retirement System

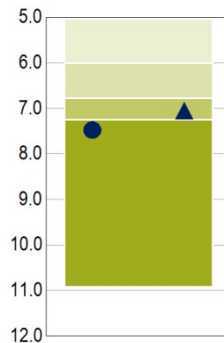
Columbia Management - Three-Year Risk/Return Characteristics vs. eA US High Yield Fixed Inc Net Universe

Annualized Excess Return



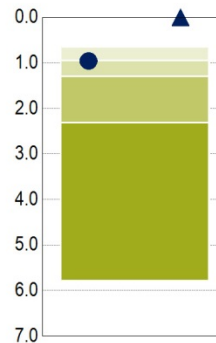
● Columbia Management	
Value	0.1
%tile	21
▲ Barclays High Yield	
Value	0.0
%tile	26
Universe	
5th %tile	1.0
25th %tile	0.1
Median	-0.4
75th %tile	-1.4
95th %tile	-4.7

Annualized Standard Deviation



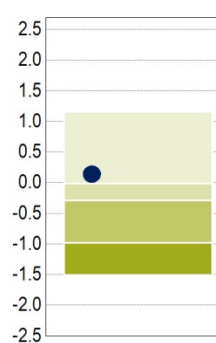
● Columbia Management	
Value	7.5
%tile	84
▲ Barclays High Yield	
Value	7.1
%tile	63
Universe	
5th %tile	5.0
25th %tile	6.0
Median	6.8
75th %tile	7.2
95th %tile	10.9

Tracking Error



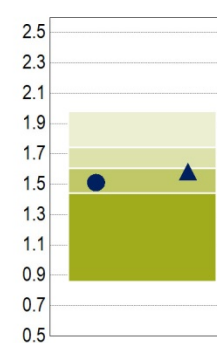
● Columbia Management	
Value	1.0
%tile	28
▲ Barclays High Yield	
Value	0.0
%tile	1
Universe	
5th %tile	0.7
25th %tile	0.9
Median	1.3
75th %tile	2.3
95th %tile	5.8

Information Ratio



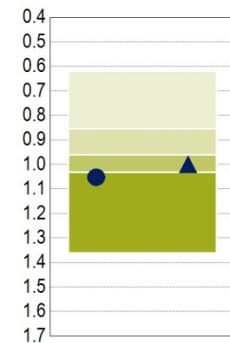
● Columbia Management	
Value	0.1
%tile	20
▲ Barclays High Yield	
Value	--
%tile	--
Universe	
5th %tile	1.2
25th %tile	0.0
Median	-0.3
75th %tile	-1.0
95th %tile	-1.5

Sharpe Ratio



● Columbia Management	
Value	1.5
%tile	66
▲ Barclays High Yield	
Value	1.6
%tile	57
Universe	
5th %tile	2.0
25th %tile	1.7
Median	1.6
75th %tile	1.4
95th %tile	0.9

Beta

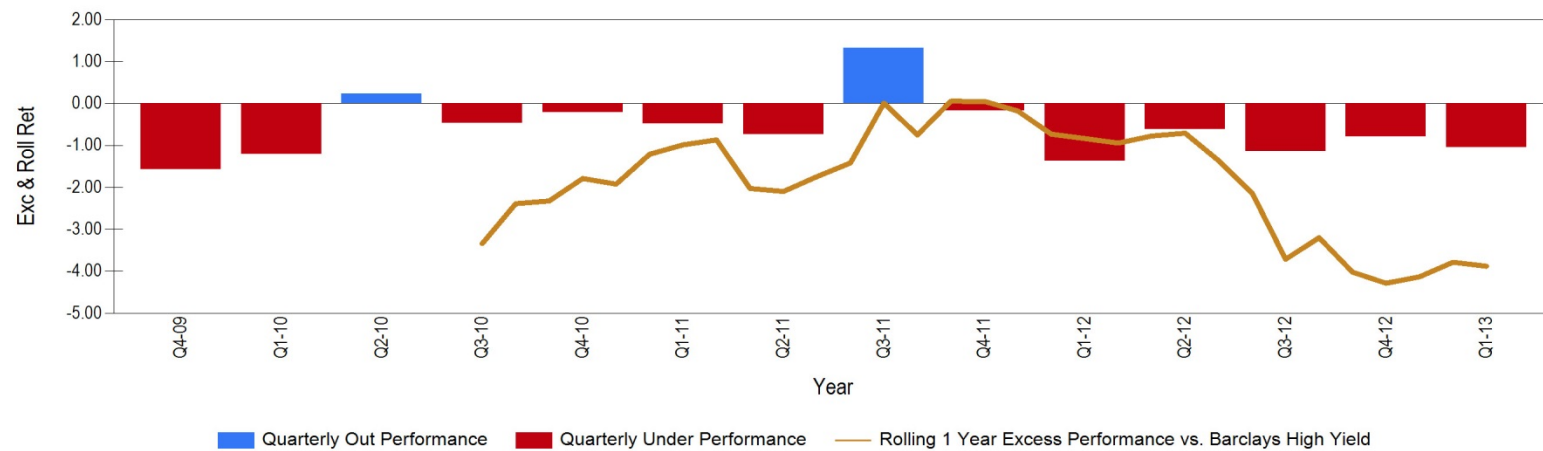


● Columbia Management	
Value	1.1
%tile	83
▲ Barclays High Yield	
Value	1.0
%tile	65
Universe	
5th %tile	0.6
25th %tile	0.9
Median	1.0
75th %tile	1.0
95th %tile	1.4

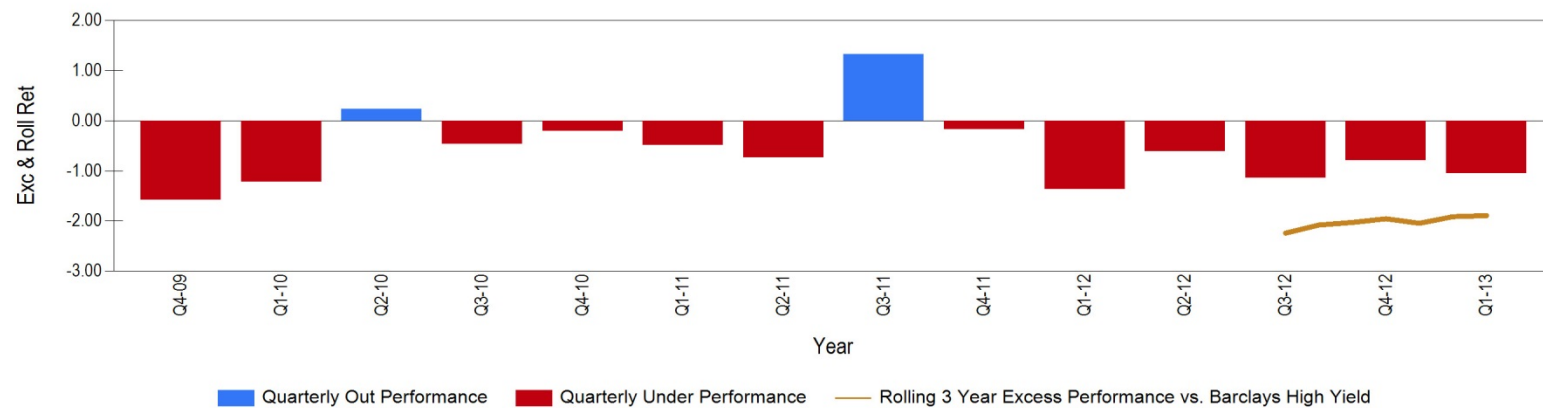
Arizona State Retirement System

Shenkman Rolling Excess Returns

Rolling 1 Year Annualized Excess Returns Since Inception (October 01, 2009)



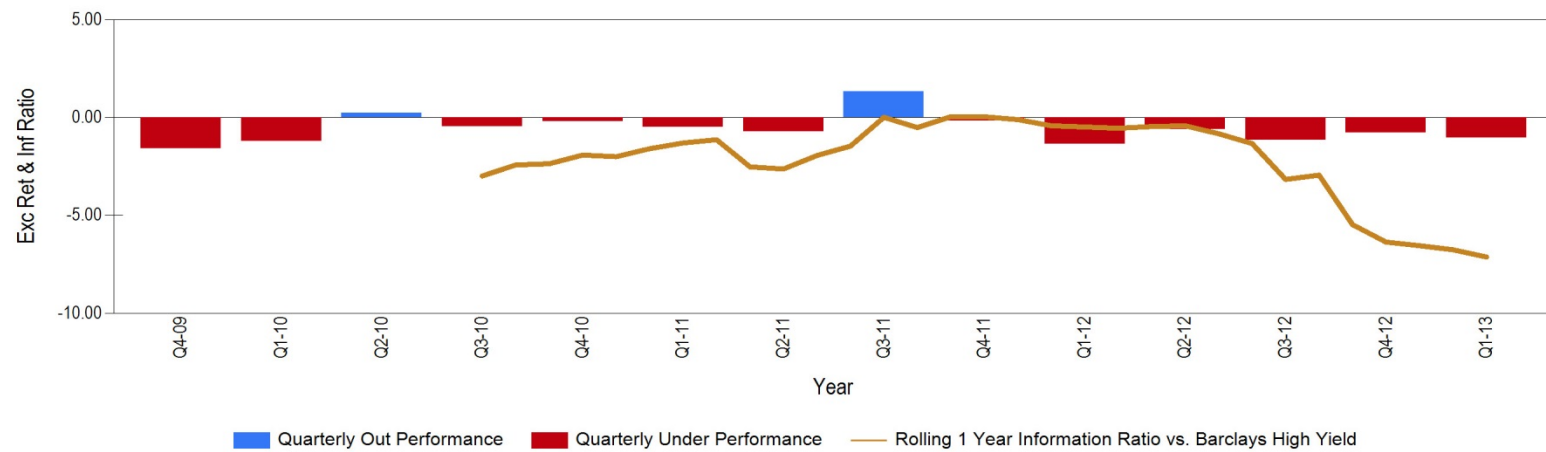
Rolling 3 Year Annualized Excess Returns Since Inception (October 01, 2009)



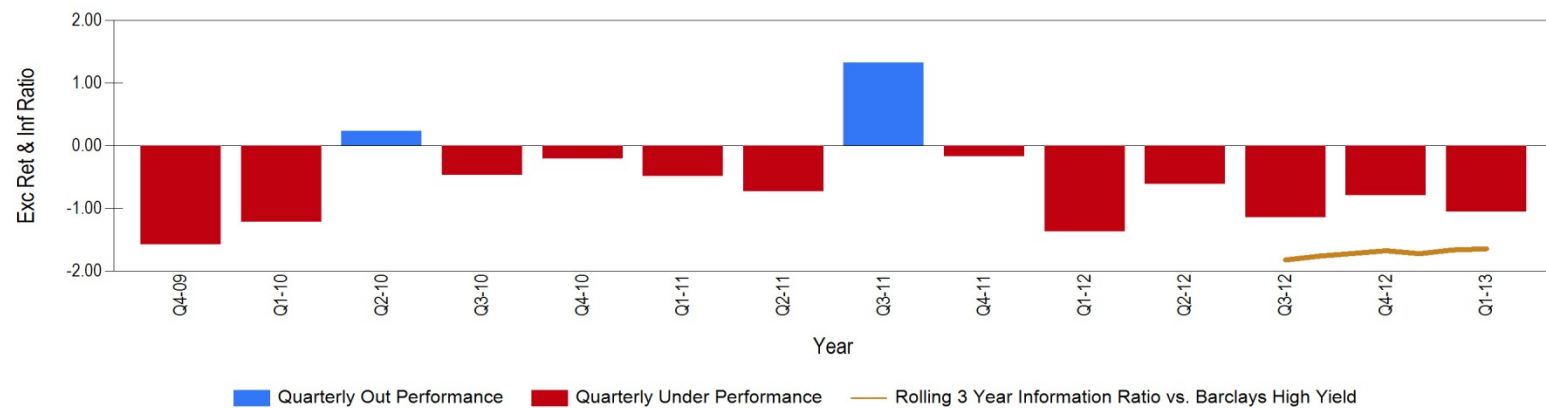
Arizona State Retirement System

Shenkman Rolling Information Ratios

Rolling 1 Year Information Ratio Since Inception (October 01, 2009)



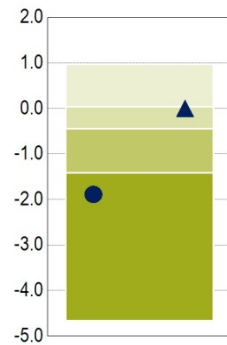
Rolling 3 Year Information Ratio Since Inception (October 01, 2009)



Arizona State Retirement System

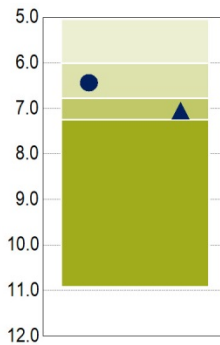
Shenkman - Three-Year Risk/Return Characteristics vs. eA US High Yield Fixed Inc Net Universe

Annualized Excess Return



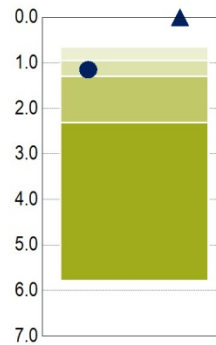
● Shenkman	
Value	-1.9
%tile	81
▲ Barclays High Yield	
Value	0.0
%tile	26
Universe	
5th %tile	1.0
25th %tile	0.1
Median	-0.4
75th %tile	-1.4
95th %tile	-4.7

Annualized Standard Deviation



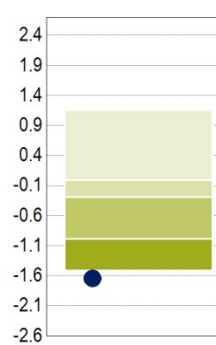
● Shenkman	
Value	6.4
%tile	38
▲ Barclays High Yield	
Value	7.1
%tile	63
Universe	
5th %tile	5.0
25th %tile	6.0
Median	6.8
75th %tile	7.2
95th %tile	10.9

Tracking Error



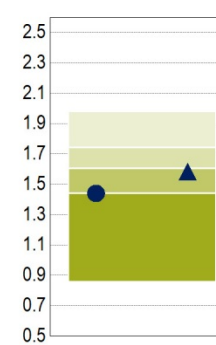
● Shenkman	
Value	1.2
%tile	47
▲ Barclays High Yield	
Value	0.0
%tile	1
Universe	
5th %tile	0.7
25th %tile	0.9
Median	1.3
75th %tile	2.3
95th %tile	5.8

Information Ratio



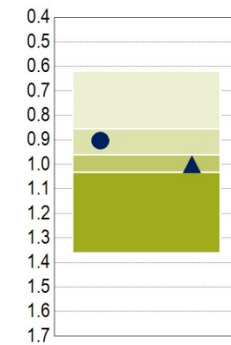
● Shenkman	
Value	-1.6
%tile	98
▲ Barclays High Yield	
Value	--
%tile	--
Universe	
5th %tile	1.2
25th %tile	0.0
Median	-0.3
75th %tile	-1.0
95th %tile	-1.5

Sharpe Ratio



● Shenkman	
Value	1.4
%tile	78
▲ Barclays High Yield	
Value	1.6
%tile	57
Universe	
5th %tile	2.0
25th %tile	1.7
Median	1.6
75th %tile	1.4
95th %tile	0.9

Beta



● Shenkman	
Value	0.9
%tile	37
▲ Barclays High Yield	
Value	1.0
%tile	65
Universe	
5th %tile	0.6
25th %tile	0.9
Median	1.0
75th %tile	1.0
95th %tile	1.4